Air Permit Application
Concurrent PTC/Tier 2 and Tier 1 Renewal

Tamarack Mill LLC
Dba Evergreen Forest

3555 Highway 95 South
New Meadows, ID

June 2006

HOY Environmental, Inc.

HOY Environmental, PLLC
1521 N. Argonne Rd. Suite #C-220 Spokane Valley, WA 99212
tel (509)892-6181 fax (509)532-9595 hoyenv@mindspring.com

TAMARACK ENERGY PARTNERSHIP

DRAWER H • NEW MEADOWS • IDAHO 83654
PHONE (208) 347-2111

IDEQ
Air Quality Permitting Department
1410 N. Hilton
Boise, ID 83706

June 12, 2006

To Whom it may concern;

This permit application is supplemental to our October 2005 Tier II submittal, in order to address incompleteness issues. However, it may be used as a stand alone document.

It is our intention to use this one application to address any Permit to Construct (PTC), Tier II and/or Tier 1 renewal issues as a concurrent application. Therefore, two copies have been provided – one for each department.

We hope this catches us up on all our outstanding permitting requirements.

If questions, please call Gerry Kincaid (boiler questions), or Gretchen Hoy (application questions.)

Sincerely,

Mark Krogh
Vice President

1 INTRODUCTION and TEXT

2 IDEQ APPLICATION FORMS

3 FLOWCHART and MAT'L BALANCE

4 EMISSION CALCULATIONS

5 LETTER TO EPA- FUEL / STEAM

6 PRIOR SOURCE TESTS

7 FUEL BTU ANALYSIS ('06)

8 EMISSION FACTOR REFERENCES

9 MODELING REPORT

10 MAP & CD (back cover)

SECTION 1

I. INTRODUCTION

This facility-wide air permit application is being submitted for Tamarack Mill, LLC, dba Evergreen Forest. The site is located on highway 95 in Adams County, ID., which is designated unclassifiable for all federal and state criteria air pollutants.

The nearest out of state town is Homestead, OR – 60 miles away by road, less as the crow flies.. The threshold for reporting to "affected states" is 50 miles.

Both SIC codes 2421 and 4911 apply for this facility.

The facility is classified as a major facility, in accordance with IDAPA 58.01.01.008.10, for Tier I permitting purposes because the facility emits or has the potential to emit a regulated air pollutant in amounts greater than or equal to 100 T/yr. The facility not major as defined in IDAPA 58.01.01.006.55, and not subject to PSD permitting requirements because the facility emits and has the potential less than 250 T/yr.

II. CURRENT PERMIT/REGUALTORY STATUS

Operating Permit No. 13-0040-0001-00 was issued to Evergreen Forest Products in 1980, for the sawmill. Tamarack Energy also received permission to construct the Cogen/boiler facility in 1982.

The facility was also given permission to burn scrap wood in 1996. However, the boiler no longer will utilize scrap wood or railroad ties as fuel.

Although the site has a Tier I permit (003-00001), a site-wide Tier II permit was never issued for the entire facility. A Tier II application was submitted in October 2005. No incompleteness letter was received, but it is understood that there were questions about dry kilns and missing maps. It also appears there was a misunderstanding that the Tier II requirement was supposed to be facility-wide.

This permit application is facility wide. It represents all current equipment on site, as well as one new proposed blowline with target box.

Submittal of this application should satisfy Violation 1 of Consent Order- Failure to submit a facility wide Tier II application. It will also subsequently prevent reoccurrence of Violations 2 and 3 (stated as failure to submit reports). Required reports were indeed submitted. However they were completed/signed by the mill believing that had truly been in compliance, while they were out of compliance for not submitting a facility-wide Tier II application.

III. SITE DESCRIPTION

IDEQ handles this facility as one site because the two businesses are under the same management and are on adjoining property. However, it is actually two separate operations. The sawmill is identified as "Evergreen Forest", and the co-generation operation is identified as "Tamarack Energy Partnership".

EVERGREEN FORESTS FACILITY DESCRIPTION

The sawmill produces green lumber from logs. The planer operation and all dry kilns have been permanently removed from service in 2002. No replacement kilns are planned at this time.

Logs are delivered to the sawmill by log truck. Log trucks enter the facility site from a paved highway, highway 95 - Logs are transported on log trucks to the log sorting area of the log yard. Logs are unloaded from the log trucks by a front-end loader and spread on the ground for scaling. Once the logs are measured they are transported via front-end loader to log storage piles. The log yard surface is covered with coarse rock.

Logs are reclaimed from the log storage piles by front-end loader. The front-end loader transports the logs to the in-feed of the sawmill at the de-barkers. Bark is removed from the logs by ring de-barkers, one for large logs and one for smaller logs. The bark falls from the de-barker to an open chain conveyor that transports the bark to a hammer hog where it is processed to hog fuel. Hog fuel exits the hammer hog and enters a pneumatic conveyance system through a rotary feeder seal valve.

The pneumatic transport system delivers hog fuel to either the fuel building or the open pile storage of the cogeneration plant. Hog fuel is disengaged from the conveyance air stream by a target box at the fuel house. Hog fuel diverted to the open pile storage is discharged through an open blowpipe. The log with bark removed is cut to length by a chop saw at the end of the de-barker prior to entering the sawmill. Sawdust from the chop saw is conveyed to the hammer hog conveyor in an open chain conveyor.

The log is processed into rough lumber in the sawmill. Chipping saws and band saws in the three log carriages process the log into lumber and cants. Cants are cut into rough lumber by the edger saws and a horizontal resaw. Saw dust from the sawing falls to the vibrating waste conveyor below the saws. The vibrating waste conveyor includes a screening section that separates the sawdust from edgings and wood chips. Saw dust is delivered to a pneumatic conveyance system through a rotary feeder seal valve. Saw dust is transported to either the fuel house or open pile storage by the pneumatic system. Saw dust delivered to the fuel house is disengaged from the air stream by a target box. Saw dust delivered to the open pile is discharged through the blowpipe. The blowline carrying sawdust through the sawmill to the pile and fuel house developed plugging problems in 2004. The problem blowline was replaced with a shorter blow line delivering sawdust to a clamshell bin. Sawdust/chips from the bin are either hauled by truck off site or hauled by truck to the fuel pile. This method of handling sawdust/chips is temporary and will be replaced with a blowline.

Edgings are conveyed to a chipper. Chips from the chipping saw and the chipper are conveyed to a truck load-out bin facility by a high-pressure pneumatic system. Wood chips are transported from the site by trucks to Potlatch.

Rough-cut lumber from the sawmill is sorted by grade and size as the lumber leaves the sawmill. Each type of lumber is separated in the sorter.

Lumber packages are transported by forklift from the sorter, to the shipping area. Green lumber is loaded onto trucks for transportation to Clearwater Forest Industries for drying.

TAMARACK ENERGY PARTNERSHIP (TEP) FACILITY DESCRIPTION

The Tamarack Energy Partnership facility is a topping cycle cogeneration facility. The facility burns woodwaste to produce steam in a water wall boiler. Steam is piped to a turbine where it drives a generator. The facility sells electrical energy and capacity to Idaho Power Company under a long-term agreement, which expires around 2020.

Hogged fuel materials consisting of sawdust, bark, and chips are delivered to the facility by the Evergreen Forests. Any make-up fuel purchased from other wood products industry in the region.

Sawdust is produced at the sawmill head rig and edger saws. Sawdust is collected in the mill waste conveyor. The mill waste conveyor transports saw dust to a rotary feeder seal valve and a high-pressure pneumatic conveyance system. The high-pressure conveyance system delivers the sawdust to either the fuel house or the open pile storage through a diverter valve. Saw dust fuel delivered to the fuel house is disengaged from the air of the conveyance system by a target box. The target box delivers the sawdust to the distribution conveyor in the top of the fuel house. Saw dust delivered to open pile storage is discharged through the open blowpipe.

Wood waste fuel purchased from other wood products is delivered in covered trailers to the fuel pile. The fuel is delivered in trailers with walking floors. The tractor trailer pulls next to the fuel pile and walks his load out of the trailer to unload the fuel.

Fuel material is recovered from the outside open pile storage by front end loader. Fuel is scooped from the pile with the wheel loader and delivered to a live bottom hopper. The live bottom hopper meters and delivers fuel to an enclosed chain conveyor that conveys the fuel to the distribution conveyor of the fuel house. The distribution conveyor deposits fuel over the fuel reclaimers.

The fuel house is a metal building enclosure that houses three reclaim conveyors. Reclaim conveyors are slat chain conveyors that reclaim wood waste from the top of the pile in the fuel house. Three reclaim conveyors are available to provide redundancy and provide twenty-four hours of wood storage within the fuel house. Reclaim conveyors drag the fuel in metered amounts to the front of the fuel house. Two reclaim conveyors deliver fuel to one open cross collection chain conveyor and one reclaimer delivers fuel to a second open collection conveyor. Only one reclaimer and one collection conveyor need operate at one time.

Each collection conveyor transports fuel to a bucket elevator. Fuel is carried by the bucket elevators to a boiler feed conveyor. Only one bucket elevator need operate corresponding to the collection conveyor in service at the time. The boiler feed conveyor is a enclosed Reddler chain conveyor that delivers fuel to the boiler metering bins on the top deck and returns excess fuel to the fuel house distribution conveyor on the bottom deck. The enclosed boiler feed conveyor delivers fuel between the fuel house and the boiler building.

Wood fuel from the boiler feed conveyor is stored in surge hoppers above the live bottom metering bins. Two metering bin surge hoppers are enclosed in the boiler building. Metering bins have twin screw conveyors in the bottom to form the live bottom. Screw speed is determined by the boiler control system in order to maintain boiler pressure. Wood fuel discharged from the screws falls through enclosed chutes to three stokers mounted on the boiler front. Stokers control the placement of fuel on the grate burning surface of the boiler. Wood material is burned in a water wall furnace boiler. Wood is the only fuel source for the boiler.

Flue gas produced in the boiler heats condensate in the boiler tubes to produce steam. Energy is recovered from the flue gas exiting the boiler/ first in an economizer and then in an air pre-heater. Large particulate and char are removed from the flue gas in a multiclone collector after exiting the economizer. Char and particulate are separated in an enclosed vibrating conveyor by mechanical screening. Char is re-injected pneumatically back into the lower boiler furnace and the particulate is transported to an enclosed drop box by the vibrating conveyor. Flue gas exiting the air heater passes through an induced draft fan and is discharged to a wet scrubber particulate collector. Cleaned flue gas exits the scrubber through the stack.

Ash collected by the scrubber is pumped to a settling pond where it is separated from the scrubber water. Ash that has settled to the bottom is removed from the pond periodically by drag line and piled to de-water. De-watered ash is land filled on site along with the dry ash collected at the multiclone.

Boiler bottom ash and clinker is continuously removed from the boiler bottom by the traveling grate. Bottom ash is delivered from the grate to an ash pit at the boiler front. An enclosed chain conveyor transports the ash from the ash pit to an enclosed drop box outside the boiler building. The bottom ash is carried in the drop box to the on site ash stockpile.

Steam produced in the boiler is piped to a turbine generator enclosed in the boiler building. Steam is expanded in the turbine and provides the motive force for the turbine to turn an electric generator. The electricity produced by the generator is delivered through a substation to Idaho Power Company. Spent steam at the exhaust of the turbine is condensed in a surface condenser and the liquid condensate returned to the boiler through feed water heaters.

Energy removed from the steam in the condenser is exhausted to atmosphere through a cooling tower. An induced draft cooling tower draws in air counter current to the water circulated through the condenser. Circulating water is pumped from the cooling tower basin through the condenser where it exchanges energy by gaining temperature. The warm water is then pumped to the top of the cooling tower where it is discharged to an enclosed reservoirs at the top of the cooling tower. The warm water drains by gravity from the reservoir to cooling tower fill where it is cooled by contact with the air drawn through the tower. Cooled water falls back to the basin. The air used to cool the water, evaporated water and a small amount of mist exit the tower through the two stacks on the top of the cooling tower. Evaporation from the cooling tower concentrates the minerals occurring in the fresh water supply. The concentration of minerals in the circulating water is controlled by blowing down or discharging water to surface drainage. Water quality is controlled in the cooling tower by the addition of chlorine bleach, polymer compounds and by blow down for control of minerals.

Water for the facility is ground water produced from a well on the site of the facility. Well water is used to replace water blown down and evaporated in the cooling tower and to make up for water lost in the form of steam. The water for replenishing the boiler is purified by a demineralizer prior to be injected into the boiler. The demineralzer removes both cation and anion minerals from the water. Minerals captured in the demineralizer are back washed or flushed from the demineralizer periodically and discharged to the scrubber sump. The demineralization process uses acid and caustic for regenerating the fill of the demineralizer. Dilute acid and caustic are discharged during regeneration to the scrubber sump where they are further diluted.

Chemicals are used to absorb oxygen from the condensate in the deareator and to prevent corrosion in the steam line in addition to treating the water make up to the boiler. Boiler condensate ~~is~~ quality is maintained by blowing down a small amount of condensate and steam on a continuous basis. Steam and liquid are separated in a blow down separator. Steam is vented to atmosphere and the liquid is discharged to the cooling tower basin.

FUELING OPERATIONS FACILITY DESCRIPTION

A truck shop and fueling station support the operation and maintenance of the mobile equipment for both the sawmill and cogeneration facilities. The fueling station consists of five above ground storage tanks. Four of the tanks store diesel fuel. Three of the diesel tanks are capable of storing 10,000 gallons and one has a capacity of 8,000 gallons. The fifth small (500 gallon) tank contains gasoline. All of the storage tanks are surrounded by a spill containment dike

IV. SPECIFIC EQUIPMENT DESCRIPTIONS

The facility includes both point and fugitive sources. The largest point source is the boiler. We have also included the associated cooling tower as a second point source.

All other equipment has been listed as fugitive.

As per the submitted and approved modeling protocol, both the boiler and cooling tower have been modeled as point sources. The remaining source have been modeled as Area source, with the exception of the storage bin unloading, TR 1 conveyor, the debarkers and hog – which were modeled as Volume sources.

All equipment emits PM and PM-10. Only the boiler and cooling tower (and fuel storage tanks) emit VOC.s

REMOVED EQUIPMENT

All equipment related to the planers was removed from service in 2002.

All existing dry kilns were also removed from service in 2002.

EXISTING EQUIPMENT

Fuel Burning Equipment (Section 2 forms)

B1 Wood bark fired stoker boiler w/ wet scrubber

Manufacturer:	Yanke Energy (Riley on nameplate)
Model:	CG-1
Steam Rate:	72,000 pounds per hour

The boiler is a Riley Stoker Boiler SN-2772 that was manufactured in 1951. In 1983, Yanke Energy remanufactured the boiler as model CG-1.

Control Description

Multiclone:	Manufacturer:	Joy Manuf.
	Model:	9-inch Joy
	Pressure Drop:	3 inches of water
Wet scrubber:		
	Manufacturer:	Yanke Energy
	Model:	CG-1 W.S.
	Pressure Drop:	5 inches of water
	Scrubber water flow rate:	40 gallons per min

The site does not discharge to the atmosphere from any fuel-burning equipment particulate matter in excess of 0.080 grains per dry standard cubic foot (gr/dscf) of effluent gas corrected to 8% oxygen by volume when fueled by wood products. The boiler is subject to the standards for new sources because it was constructed after October 1, 1979.

Process Equipment (Section 3 forms)

COOL Cooling Tower
Water flow rate: 6,500 gallons per minute
P1-2 Debarkers (2) and Hog (insignificant)
P-3 Hammer Hog

Volatile Compounds (Section 5 forms)

V1 Gasoline AST
V2 Diesel AST
V3 Parts washers
V4 Lube/oil storage

Transfer Emission Sources (Section 7 forms)

TR1 Conveyor transfer to stockpile
TR2 Blowpipe (refer to proposed equipment – target box.)
TR3-5 Transfer to trucks (3) for wood by-products and ash
TR6 Unloading chip/sawdust bins

Storage Emission Sources (Section 7 forms)

ST2 Outdoor fuel storage pile
ST3-4 Chips and sawdust storage bins

Road Fugitive Emissions (Section 8 forms)

Travel on unpaved roads
Dust abatement includes a water truck 1 or 2 times per day.

PROPOSED EQUIPMENT

P-4 New high-pressure chip blowline with target box

DEMINIUMUS/EXEMPT EQUIPMENT

Insignificant according to IDAPA 58.01.01.317.01(b), citation 30.

Emergency back-up fire pump. 150 h.p. diesel fired

Log debarkers (P-1 and 2)
Debarker conveyor drop
Log yard loader drop
Cut off saws
Log yard conveyor drop
Truck to fuel pile (TR-4)
Fuel pile loader reclaim
Fuel pile loader drop
Reclaim conveyor drop
Mill waste conveyor drop
Trim and sawdust conveyor
Reclaimer conveyor drop
Fuel storage pile
Bottom ash to landfill
Fly ash to landfill (TR-5)

V. EXPLANATION OF CALCULATIONS

GENERAL NOTES

The standard procedure of multiplying throughput time an appropriate emission factors was used for all of the annual emission calculations. Hourly emissions were calculated by taking the annual emissions and dividing by the projected hours of operation for that part of the facility. Generally speaking, the boiler co-gen facility runs 8400 hrs per year and the sawmill portion runs 6240 hours per year.

References for available emissions factors (EF's) are provided in Tab 8.

There were several options available to calculate emissions for the co-gen boiler. There were prior source tests with different fuels and steam loads, as well as AP-42. All options have been listed on the table in the calculation pages (Tab 4), but only the highest number was used in the basis to determine Potential to Emit (PTE). (Refer to the light green highlighted row at the bottom of the table.)

In order to bring the calculations to the current "BTU consumed" version of AP-42, a recent BTU lab analysis was completed and is presented in Tab 7.

PROCESS FLOW SCHEMATIC

All emission calculations are based on throughput or consumption. In order to accurately measure/predict these quantities, a facility wide material process flow schematic was completed. All wood was converted to bone dry weight (BDT) and balanced such that material flows in, matched all material flows out of the facility.

The graphic version as well as the mathematical support is present in Tab 3.

ANNUAL EMISSIONS

Annual, hourly and maximum hourly emission calculations are presented in Tab 4. As stated earlier, the emissions were calculated based on throughput/consumption time the appropriate EF. Annual results were converted to tons/yr. All other calculations are in lb/hr.

It was assumed that there might be as much as a 10% swing in production variability (fuel quality, species considerations, steam demand) and maximum hourly emissions are simply 110% of projected average hourly emissions.

HAPS

Site produced Haps emission from the boiler, cooling tower and petroleum products. Site wide calculations indicate the facility is only a minor source for HAPs. All HAP (and boiler TAP) emission are presented in Tab 4.

PROCESS WEIGHT LIMITS

Process weight limits appear to already have been addressed previously, and the planer cyclone is no longer in service. Since all equipment was constructed after October 1, 1979, the following equations would be used:

Where E is the allowable emission from the entire source in pounds per hour, and PW is the process weight in pounds.

If PW is less than 9,250 lb/hr, $E = 0.045\ (PW)^{0.6}$

If PW is equal to or greater than 9,250 lb/hr, $E = 1.10\ (PW)^{0.25}$

VI. MODELING ANALYSIS/REPORT

The completed modeling report is presented in Tab 9. Please note; this is not an amendment to the previously submitted modeling report, but a new one altogether.

An electronic version (CD) of the files is also included.

VII. OTHER ISSUES

OPEN BURNING The facility does conduct open burning one or two times per year and complies with IDAPA 58.01.01.600-616.

LOW SUFUR FUEL. The facility does keep records of sulfur content of diesel fuel. (Maintaining documentation that shows all distillate fuel oil received contains no more than 0.3% sulfur by weight for grade 1 and 0.5% sulfur by weight for grade 2.)

MEASURING STEAM DEMAND INSTEAD OF FUEL. The facility has applied to EPA for permission to monitor steam production in lieu of fuel consumption to meet 40CFR 60.49b(d). Refer to Tab 5 for a copy of the correspondence.

ASBESTOS If the is any renovation/demolition, the facility will comply with 40 CFR Part 61, Subpart M.

ALTERNATIVE OPERATING SCENARIOES. No alternative operating or trading scenarios requested.

PAYMENT OF FEES. The facility is current with annual payment of fees.

NESHAPS Subpart Q. 40 CFR 60, 61, and 63 No standards in 40 CFR Parts 60, 61, and 63 are applicable to emission units at the Tamarack Mills facility, since the facility is minor for HAPs.

VIII. MAPS

A site layout map is provided in the back cover pocket.

SECTION 2

SECTION 1: GENERAL INFORMATION

COMPANY & DIVISION NAME	Tamarack Energy Partnership & Clearwater Forest Industries, LLC dba Evergreen Forest
STREET ADDRESS OR P.O. BOX	P.O. Drawer H
CITY	New Meadows
STATE	Idaho
ZIP	83654
PERSON TO CONTACT	Gerry Kincaid
TITLE	Plant Superintendent
PHONE NUMBER	208 347 2216
EXACT PLANT LOCATION	6 miles South West of New Meadows, Idaho beside Highway 95
GENERAL NATURE OF BUSINESS	Sawmill and Electrical Co-generation
NUMBER OF FULL-TIME EMPLOYEES	60
PROPERTY AREA (ACRES)	98.6 +/-
REASON FOR APPLICATION (1) Change of Owner or Location (2) Tier I Permit to Operate (3) Tier II Permit to Operate	PTC & Tier 1/2
DISTANCE TO NEAREST STATE BORDER (MILES)	22
PRIMARY SIC	2421
SECONDARY SIC	4911
PLANT LOCATION COUNTY	Adams
ELEVATION (FT)	4120
UTM ZONE	11
UTM (X) COORDINATE (KM)	548356
UTM (Y) COORDINATE (KM)	1978100

List all facilities with the State that are under your control or under common control and have emissions to the air. If none, so state.

NAME OF FACILITIES	LOCATION OF OTHER FACILITIES
Clearwater Forest Industries	Kooskia, Idaho

OWNER OR RESPONSIBLE OFFICIAL	Mark Krogh
TITLE OF RESPONSIBLE OFFICIAL	Vice President

Based on information and belief formed after reasonable inquiry
I certify the statements and information in this document are accurate and complete.

SIGNATURE OF OWNER OR RESPONSIBLE OFFICIAL

DATE 6/13/06

SECTION 2: FUEL BURNING EQUIPMENT

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION: B-1 Wood/bark fired stoker Boiler with scrubber , 450 psig

STACK DESCRIPTION: Scrubber Stack

BUILDING DESCRIPTION: Boiler Turbine Building

MANUFACTURER: Yanke Energy | MODEL: CG-1 | DATE INSTALLED: May-83

DATE LAST MODIFIED: None

RATED CAPACITY (CHOOSE APPROPRIATE UNITS)

MILLION BTU/HR	NA	1000 LBS STEAM/HR	72	KILOWATTS	NA	HP	NA
BURNER TYPE	01, 02	% USED FOR PROCESS	100%				
		% USED FOR SPACE HEAT	0				

FUEL DATA (from prior submittal, except BTU recently tested in 2006)

PARAMETER		PRIMARY FUEL	UNITS	SECONDARY FUEL	UNITS
FUEL CODE (SEE NOTE)		06, 07		NONE	
PERCENT SULFUR		0.01%			
PERCENT ASH		3.03%			
PERCENT NITROGEN		0.22%			
PERCENT CARBON		50.62%			
PERCENT HYDROGEN		6.51%			
PERCENT MOISTURE		45%			
HEAT CONTENT (BTU/UNIT)		8100	BTU/ pound dry		
MAXIMUM HOURLY COMBUSTION RATE (UNITS/HR)		11.75	GT/hour		
NORMAL ANNUAL COMBUSTION RATE (UNITS/YR)	(10.5 *8400)	88200	BDT/yr		

NOTE: BURNER TYPE - 01) SPREAD STOKER; 02) CHAIN OR TRAVELING GRATE; 03) HAND FIRED; 04) CYCLONE FURNACE;

05) WET BOTTOM (PULVERIZED COAL); 06) DRY BOTTOM (PULVERIZED COAL);

07) UNDERFEED STOKERS; 08) TANGENTIALLY FIRED; 09) HORIZONTALLY FIRED; 10) AXIALLY FIRED;

11) OTHER (SPECIFY) Riley spread stoker, travelling grate, dry bottom

FUEL CODES - 01) NATURAL GAS; 02) #1 OR #2 FUEL OIL; 03) #4 FUEL OIL; 04) #5 OR #6 FUEL OIL; 05) USED OIL

06) WOOD CHIPS; 07) WOOD BARK; 08) WOOD SHAVINGS; 09) SANDER DUST;

10) SUBBITUMINOUS COAL; 11) BITUMINOUS COAL; 12) ANTHRACITE COAL; 13) LIGNITE COAL

14) PROPANE; 15) OTHER (SPECIFY) 07 Wood/bark

SECTION 2, PART B

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER		OPERATING SCHEDULE	
DEC-FEB	25%	HOURS/DAY	24
MAR-MAY	25%	DAY/WEEK	7
JUN-AUG	25%	WEEKS/YEAR	50
SEP-NOV	25%		(8400 HR/YR)

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	"D" Type wet scrubber	9 inch multiclone
TYPE CODE (FROM APP. A)	002	077
MANUFACTURER	Yanke Energy	Joy Manufacturing
MODEL NUMBER	CG-1 WS	9" Joy
PRESSURE DROP (IN. OF WATER)	5	3
WET SCRUBBER FLOW (GPM)	40	NA
BAGHOUSE AIR/CLOTH RATIO (FPM)	NA	NA

VENTILATION AND BUILDING/AREA DATA STACK DATA

ENCLOSED (Y/N)?	Yes	GROUND ELEVATION (FT)	1265.9
HOOD TYPE (FROM APP. B)		UTM X COORDINATE (KM)	548412
MINIMUM FLOW (ACFM)	small exst top of bldg	UTM Y COORDINATE (KM)	4977936
PERCENT CAPTURE EFFICIENCY		STACK TYPE (SEE NOTE BELOW)	02
BUILDING HEIGHT (FT)	60	STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	75
BUILDING/AREA LENGTH (FT)	114	STACK EXIT DIAMETER (FT)	7.25
BUILDING/AREA WIDTH (FT)	40	STACK EXIT GAS FLOWRATE (ACFM)	46439
		STACK EXIT TEMPERATURE (DEG. F)	156

AIR POLLUTANT EMISSIONS (REFER TO NOTE 1 BELOW)

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW) #/MMBtu	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	(TONS/YR)	REFERENCE
PM				REFER TO CALCS			
PM-10				REFER TO CALCS			
SO2				REFER TO CALCS			
CO				REFER TO CALCS			
NOX				REFER TO CALCS			
VOC				REFER TO CALCS			
LEAD				REFER TO CALCS			
HAPs				REFER TO CALCS			
TAPs				REFER TO CALCS			

Note (1) **Due to the fact that there have been several sorurce tests, the calculations have been provided using every potential EF, including AP-42. In the calculation tab, only the worst case (largest emission) factor was used, in an effort to be conservative. Refer to the BOLD numbers.**

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE

EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 3: PROCESS AND MANUFACTURING OPERATIONS

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION	COOLING TOWER
STACK DESCRIPTION	TWO FAN STACKS
BUILDING DESCRIPTION	2 CELL COOLING TWR 35' WIDE by 40' LONG by 30' TALL

MANUFACTURER	MARLEY	MODEL	NA	DATE INSTALLED	1983
				DATE LAST MODIFIED	all original

PROCESSING DATA

PROCESS STREAM	MATERIAL DESCRIPTION	MAXIMUM HOURLY RATE	ACTUAL HOURLY RATE	UNITS
INPUT	COLD WATER		50 to 100	GPM
PRODUCT OUTPUT	WATER VAPOR EVAPORATED	55000	55000	lb/HR
WASTE OUTPUT	WATER MIST (DRIFT)	162.4	162.4	lb/HR
RECYCLE	WASTE HEAT	5.50E+07	5.50E+07	Btu/hr

POTENTIAL HAPS IN PROCESS STREAM(S)

HAP DESCRIPTION	HAP CAS NUMBER	FRAC IN INPUT STREAM BY WT	FRAC IN PRODUCT STREAM BY WT	FRAC IN WASTE STREAM BY WT	FRACTION IN RECYCL STREAM BY WEIGHT
POTASSIUM HYDROXIDE	1310583			2.11E-05	
CHLORINE BLEACH NaOCl	7681-52-9			3.01E-06	

SECTION 3, PART B

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER

DEC-FEB	25
MAR-MAY	25
JUN-AUG	25
SEP-NOV	25

OPERATING SCHEDULE (Same as Co Gen)

HOURS/DAY	24
DAY/WEEK	7
WEEKS/YEAR	50

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	NONE	
TYPE CODE (FROM APP. A)		
MANUFACTURER		
MODEL NUMBER		
PRESSURE DROP (IN. OF WATER)		
WET SCRUBBER FLOW (GPM)		
BAGHOUSE AIR/CLOTH RATIO (FPM)		

VENTILATION AND BUILDING/AREA DATA

ENCLOSED (Y/N)?	NO
HOOD TYPE (FROM APP. B)	N/A
MINIMUM FLOW (ACFM)	N/A
PERCENT CAPTURE EFFICIENCY	N/A
BUILDING HEIGHT (FT)	30
BUILDING/AREA LENGTH (FT)	40
BUILDING/AREA WIDTH (FT)	35

STACK DATA

GROUND ELEVATION (FT)	4,140
UTM X COORDINATE (KM)	548,360
UTM Y COORDINATE (KM)	4,978,075
STACK TYPE (SEE NOTE BELOW)	2
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	30
STACK EXIT DIAMETER (FT)	16
STACK EXIT GAS FLOWRATE (ACFM)	180,000
STACK EXIT TEMPERATURE (DEG. F)	85

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	REF
PM				0.068			
PM-10				0.068			
SO2							
CO							
NOX							
VOC							
LEAD							
POTASIUM HYDROXIDE	1310583			3.42E-03	See CALCS	See CALCS	See CALCS
CHLORINE BLEACH	7681-52-9			7.32E-05	See CALCS	See CALCS	See CALCS

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE

EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 3: PROCESS AND MANUFACTURING OPERATIONS

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION	Debarkers(2) and hog
STACK DESCRIPTION	Fugitives
BUILDING DESCRIPTION	N/A

MANUFACTURER	NA	MODEL	NA	DATE INSTALLED	1982
				DATE LAST MODIFIED	oringinal

PROCESSING DATA **Refer to calculation tables**

PROCESS STREAM	MATERIAL DESCRIPTION	MAXIMUM HOURLY RATE	ACTUAL HOURLY RATE	UNITS
INPUT	Green wood		SEE CALCS	
PRODUCT OUTPUT				
WASTE OUTPUT				
RECYCLE	Hog fuel/chips/bark		SEE CALCS	

POTENTIAL HAPS IN PROCESS STREAM(S)

HAP DESCRIPTION	HAP CAS NUMBER	FRACTION IN INPUT STREAM BY WEIGHT	ACTION IN PRODUC TREAM BY WEIGHT	FRACTION IN WASTE STREAM BY WEIGHT	RACTION IN RECY STREAM BY WEIG
NA					

SECTION 3, PART B

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER

DEC-FEB	25
MAR-MAY	25
JUN-AUG	25
SEP-NOV	25

OPERATING SCHEDULE — Note: Matches sawmill op hrs)

HOURS/DAY	20
DAY/WEEK	6
WEEKS/YEAR	52

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	NONE	
TYPE CODE (FROM APP. A)	N/A	
MANUFACTURER	N/A	
MODEL NUMBER	N/A	
PRESSURE DROP (IN. OF WATER)	N/A	
WET SCRUBBER FLOW (GPM)	N/A	
BAGHOUSE AIR/CLOTH RATIO (FPM)	N/A	

VENTILATION AND BUILDING/AREA DATA

ENCLOSED (Y/N)?	NO
HOOD TYPE (FROM APP. B)	N/A
MINIMUM FLOW (ACFM)	N/A
PERCENT CAPTURE EFFICIENCY	N/A
BUILDING HEIGHT (FT)	N/A
BUILDING/AREA LENGTH (FT)	N/A
BUILDING/AREA WIDTH (FT)	N/A

STACK DATA

GROUND ELEVATION (FT)	4,140
UTM X COORDINATE (KM)	See CALCS
UTM Y COORDINATE (KM)	See CALCS
STACK TYPE (SEE NOTE BELOW)	05
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	MIN
STACK EXIT DIAMETER (FT)	NA
STACK EXIT GAS FLOWRATE (ACFM)	NA
STACK EXIT TEMPERATURE (DEG. F)	ambient

AIR POLLUTANT EMISSIONS

Refer to calcuation tables

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	REF
PM		0.024	NA	See CALCS	See CALCS	See CALCS	IDEQ T&W
PM-10		0.011	NA	See CALCS	See CALCS	See CALCS	IDEQ T&W
SO2		NA					
CO		NA					
NOX		NA					
VOC		NA					
LEAD		NA					

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE

EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 3: PROCESS AND MANUFACTURING OPERATIONS

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION	P-4 Proposed target box at end of new chip blowline
STACK DESCRIPTION	N/A
BUILDING DESCRIPTION	NA

MANUFACTURER: NA   MODEL: NA   DATE INSTALLED: 2006?

DATE LAST MODIFIED: NA

PROCESSING DATA   **Refer to calculation tables**

PROCESS STREAM	MATERIAL DESCRIPTION	MAXIMUM HOURLY RATE	ACTUAL HOURLY RATE	UNITS
INPUT	Chips	See Calcs	See Calcs	BDT
PRODUCT OUTPUT	Chips	See Calcs	See Calcs	BDT
WASTE OUTPUT				
RECYCLE				

POTENTIAL HAPS IN PROCESS STREAM(S)

HAP DESCRIPTION	HAP CAS NUMBER	FRACTION IN INPUT STREAM BY WEIGHT	ACTION IN PRODI TREAM BY WEIGI	FRACTION IN WASTE STREAM BY WEIGHT	RACTION IN RECY STREAM BY WEIG
NA					

SECTION 3, PART B

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER		OPERATING SCHEDULE	
DEC-FEB	25	HOURS/DAY	
MAR-MAY	25	DAY/WEEK	
JUN-AUG	25	WEEKS/YEAR	
SEP-NOV	25		

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	NONE	
TYPE CODE (FROM APP. A)		
MANUFACTURER		
MODEL NUMBER		
PRESSURE DROP (IN. OF WATER)		
WET SCRUBBER FLOW (GPM)		
BAGHOUSE AIR/CLOTH RATIO (FPM)		

VENTILATION AND BUILDING/AREA DATA

ENCLOSED (Y/N)?	NO
HOOD TYPE (FROM APP. B)	N/A
MINIMUM FLOW (ACFM)	N/A
PERCENT CAPTURE EFFICIENCY	N/A
BUILDING HEIGHT (FT)	N/A
BUILDING/AREA LENGTH (FT)	N/A
BUILDING/AREA WIDTH (FT)	N/A

STACK DATA

GROUND ELEVATION (FT)	1,268
UTM X COORDINATE (KM)	548335
UTM Y COORDINATE (KM)	4977974
STACK TYPE (SEE NOTE BELOW)	05
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	6
STACK EXIT DIAMETER (FT)	NA
STACK EXIT GAS FLOWRATE (ACFM)	ambient
STACK EXIT TEMPERATURE (DEG. F)	ambient

AIR POLLUTANT EMISSIONS

Refer to calcuation tables

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	REF
PM		0.10		See CALCS	See CALCS	See CALCS	IDEQ T&W
PM-10		0.05		See CALCS	See CALCS	See CALCS	IDEQ T&W
SO2		NA					
CO		NA					
NOX		NA					
VOC		NA					
LEAD		NA					

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE
EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 5: STORAGE AND HANDLING OF LIQ SOLV & OTHER VOL COMPDS

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION: GASOLINE STORAGE TANK

STACK DESCRIPTION: 1 INCH VENT

BUILDING DESCRIPTION: 4 FT DAIMETER BY 6 FT LONG ABOVE GROUND STORAGE TANK

DATE INSTALLED: 2002 DATE LAST MODIFIED:

GENERAL TANK AND MATERIAL HANDLING DATA

MATERIAL DESCRIPTION: GASOLINE

TANK CAPACITY (GAL): 500 ANNUAL THROUGHPUT (GALLONS): 12000

TANK TYPE: 3

PLEASE CHOOSE FROM BELOW
(01) FIXED ROOF
(02) FLOATING ROOF (OR INTERNAL COVER)
(03) VARIABLE VAPOR SPACE
(04) PRESSURE TANK
(05) UNDERGROUND - SPLASH LOADING
(06) OTHER

SOURCE: 3

PLEASE CHOOSE FROM BELOW
(01) PIPELINE
(02) RAIL CAR
(03) TANK TRUCK
(04) SHIP BARGE
(05) OTHER

ADDITIONAL VAPOR PHASE DEGREASING DATA

MANUF OF DEGREASING AGENT:

TEMPERATURE OF DEGREASING AGENT IN TANK (DEG. F):

TANK SURFACE AREA (SQ. FT):

METHOD OF VAPOR RECOVERY:
Please choose from below:
(01) Incineration
(02) Refrigerated Liquid Scrubber
(03) Refrigerated Condenser
(04) Carbon Adsorption
(05) Vapor Return System
(06) No Recovery System
(07) Other

ADDITIONAL MATERIAL HANDLING DATA

PHYSICAL STATE: LIQUID

NUMBER OF PUMP SEALS: NONE GRAV FD

NUMBER OF IN-LINE VALVES: 2

NUMBER OF SAFETY RELIEF VALVES:

NUMBER OF OPEN-ENDED LINES:

NUMBER OF SAMPLING CONNECTIONS: 1

NUMBER OF SAMPLING CONNECTIONS:

MATERIAL DATA

HAP DESCRIPTION	HAP CAS NUMBER	HAP FRACTION IN MATERIAL BY WEIGHT
SEE Calcs	SEE Calcs	SEE Calcs

SECTION 5, PART B GASOLINE STORAGE

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER

DEC-FEB	25
MAR-MAY	25
JUN-AUG	25
SEP-NOV	25

OPERATING SCHEDULE

HOURS/DAY	N/A
DAY/WEEK	N/A
WEEKS/YEAR	N/A

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	NONE	
TYPE CODE (FROM APP. A)		
MANUFACTURER		
MODEL NUMBER		
PRESSURE DROP (IN. OF WATER)		
WET SCRUBBER FLOW (GPM)		
BAGHOUSE AIR/CLOTH RATIO (FPM)		

VENTILATION AND BLD/AREA DATA

ENCLOSED (Y/N)?	NO
HOOD TYPE (FROM APP. B)	NONE
MINIMUM FLOW (ACFM)	
PERCENT CAPTURE EFFICIENCY	
BUILDING HEIGHT (FT)	NONE
BUILDING/AREA LENGTH (FT)	
BUILDING/AREA WIDTH (FT)	

STACK DATA

GROUND ELEVATION (FT)	4,120
UTM X COORDINATE (KM)	548,280
UTM Y COORDINATE (KM)	4,978,525
STACK TYPE (SEE NOTE BELOW)	1.0
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	12.0
STACK EXIT DIAMETER (FT)	0.083
STACK EXIT GAS FLOWRATE (ACFM)	0.000
STACK EXIT TEMPERATURE (DEG. F)	ambient

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	ALLOWABLE EMISSIONS REFERENCE
PM							
PM-10							
SO2							
CO							
NOX							
VOC							
LEAD		See CALCS	See CALCS	See CALCS	See CALCS	See CALCS	See CALCS
HAPS	See CALCS	See CALCS	See CALCS	See CALCS	See CALCS	See CALCS	See CALCS

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE

EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 5: STORAGE AND HANDLING OF LIQ SOLV & OTHER VOL COMPDS

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION: LIQUID FUEL STORAGE AREA

STACK DESCRIPTION: EACH OF 4 TANKS HAS A 2 INCH DIAMETER PIPE BREATHER

BUILDING DESCRIPTION: 3 EACH 10k GAL 8' DIA by 28' LONG, 1 EACH 8k GAL 8' DIA by 22' LONG

DATE INSTALLED: 1980 DATE LAST MODIFIED: NA

GENERAL TANK AND MATERIAL HANDLING DATA

MATERIAL DESCRIPTION: DIESEL FUEL

TANK CAPACITY (GALS): 38,000 ANNUAL THROUGHPUT (GALLONS): 118,000

TANK TYPE: 3

PLEASE CHOOSE FROM BELOW
(01) FIXED ROOF
(02) FLOATING ROOF (OR INTERNAL COVER)
(03) VARIABLE VAPOR SPACE
(04) PRESSURE TANK
(05) UNDERGROUND - SPLASH LOADING
(06) OTHER

SOURCE: 3

PLEASE CHOOSE FROM BELOW
(01) PIPELINE
(02) RAIL CAR
(03) TANK TRUCK
(04) SHIP BARGE
(05) OTHER

ADDITIONAL VAPOR PHASE DEGREASING DATA

MANUFCTR OF DEGREASING AGENT: N/A

TEMPERATURE OF DEGREASING AGENT IN TANK (DEG. F):

TANK SURFACE AREA (SQ. FT):

METHOD OF VAPOR RECOVERY:
Please choose from below:
(01) Incineration
(02) Refrigerated Liquid Scrubber
(03) Refrigerated Condenser
(04) Carbon Adsorption
(05) Vapor Return System
(06) No Recovery System
(07) Other

ADDITIONAL MATERIAL HANDLING DATA

PHYSICAL STATE: LIQUID

NUMBER OF PUMP SEALS: 1

NUMBER OF IN-LINE VALVES: 2

NUMBER OF SAFETY RELIEF VALVES:

NUMBER OF OPEN-ENDED LINES:

NUMBER OF SAMPLING CONNECTIONS:

NUMBER OF SAMPLING CONNECTIONS: 1

MATERIAL DATA

HAP DESCRIPTION	HAP CAS NUMBER	HAP FRACTION IN MATERIAL BY WEIGHT

SECTION 5, PART B
DIESEL STORAGE

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER		OPERATING SCHEDULE	
DEC-FEB	25	HOURS/DAY	N/A
MAR-MAY	25	DAY/WEEK	N/A
JUN-AUG	25	WEEKS/YEAR	N/A
SEP-NOV	25		

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	NONE	
TYPE CODE (FROM APP. A)		
MANUFACTURER		
MODEL NUMBER		
PRESSURE DROP (IN. OF WATER)		
WET SCRUBBER FLOW (GPM)		
BAGHOUSE AIR/CLOTH RATIO (FPM)		

VENTILATION AND BUILDING/AREA DATA

ENCLOSED (Y/N)?	NO
HOOD TYPE (FROM APP. B)	NONE
MINIMUM FLOW (ACFM)	N/A
PERCENT CAPTURE EFFICIENCY	N/A
BUILDING HEIGHT (FT)	NONE
BUILDING/AREA LENGTH (FT)	N/A
BUILDING/AREA WIDTH (FT)	N/A

STACK DATA

GROUND ELEVATION (FT)	4120
UTM X COORDINATE (KM)	548280
UTM Y COORDINATE (KM)	4978525
STACK TYPE (SEE NOTE BELOW)	1
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	10
STACK EXIT DIAMETER (FT)	0.166666667
STACK EXIT GAS FLOWRATE (ACFM)	Ambient
STACK EXIT TEMPERATURE (DEG. F)	Ambient

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	REFERENCE
PM							
PM-10							
SO2							
CO							
NOX							
VOC		.596 #/1000 GAL	NONE	See Calcs	See Calcs	See Calcs	See Calcs
LEAD							

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE
EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 7: SOLID MATERIAL TRANSPORT, HANDLING, AND STORAGE

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION: TR-1 CONVEYOR TO STOCKPILE

STACK DESCRIPTION: N/A

BUILDING DESCRIPTION: N/A

DATE INSTALLED OR LAST MODIFIED: 1982 DATE LAST MODIFIED: ORIGINAL

MATERIAL DESCRIPTION: Hogged Fuel

MATERIAL TRANSFER RATES

MAXIMUM HOURLY TRANSFER RATE (UNITS/HOUR): See CALCS TONS/HR

NORMAL HOURLY TRANSFER RATE (UNITS/HOUR): See CALCS TONS/HR

NORMAL ANNUAL TRANSFER RATE (UNITS/YEAR): See CALCS TONS/YR

UNIT OF MEASURE: BDT

BELT CONVEYOR/VEHICLE TRANSFER

NUMBER OF TRANSFERS: N/A

MATERIAL MOISTURE CONTENT (WEIGHT PERCENT): @ 50%

MAXIMUM HOURLY WIND SPEED (MPH):

CONVEYORS ENCLOSED? (Y/N):

CONVEYORS IN BUILDINGS? (Y/N):

AVERAGE HOURLY WIND SPEED (MPH):

TRANSFERS ENCLOSED? (Y/N):

TRANSFERS IN BUILDINGS? (Y/N):

PNEUMATIC CONVEYOR TRANSFERS

MATERIAL MOISTURE CONTENT (WEIGHT PERCENT): N/A

PRIMARY SEPARATOR TYPE:

PRIMARY SEPARATOR % EFFICIENCY:

SECONDARY SEPARATOR TYPE:

SECONDARY SEPARATOR % EFFICIENCY:

MATERIAL STORAGE DATA

PILE? (Y/N):

STORAGE CAPACITY:

PILE LENGTH (FT.):

SILO? (Y/N):

STORAGE CAPACITY UNITS:

PILE WIDTH (FT.):

OTHER STORAGE TYPE DESCRIPTION:

PILE HEIGHT (FT.):

MATERIAL DATA

HAP DESCRIPTION	HAP CAS NUMBER	HAP FRACTION IN MATERIAL BY WEIGHT
NONE	N/A	N/A

SECTION 7, PART B TR-1

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER

DEC-FEB	25
MAR-MAY	25
JUN-AUG	25
SEP-NOV	25

OPERATING SCHEDULE

HOURS/DAY	20
DAY/WEEK	6
WEEKS/YEAR	52

SAWM AS SAWMILL
6240

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	NONE	
TYPE CODE (FROM APP. A)		
MANUFACTURER		
MODEL NUMBER		
PRESSURE DROP (IN. OF WATER)		
WET SCRUBBER FLOW (GPM)		
BAGHOUSE AIR/CLOTH RATIO (FPM)		

VENTILATION AND BUILDING/AREA DATA

ENCLOSED (Y/N)?	NO
HOOD TYPE (FROM APP. B)	N/A
MINIMUM FLOW (ACFM)	N/A
PERCENT CAPTURE EFFICIENCY	0
BUILDING HEIGHT (FT)	N/A
BUILDING/AREA LENGTH (FT)	N/A
BUILDING/AREA WIDTH (FT)	N/A

STACK DATA

GROUND ELEVATION (FT)	1265 M
UTM X COORDINATE (KM)	548385
UTM Y COORDINATE (KM)	4977988
STACK TYPE (SEE NOTE BELOW)	05
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	10
STACK EXIT DIAMETER (FT)	N/A
STACK EXIT GAS FLOWRATE (ACFM)	AMBIENT
STACK EXIT TEMPERATURE (DEG. F)	60

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	REFERENCE
PM		See CALCS		See CALCS	See CALCS	See CALCS	See CALCS
PM-10		See CALCS		See CALCS	See CALCS	See CALCS	See CALCS
SO2							
CO							
NOX							
VOC							
LEAD							
NONE							

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE
EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 7: SOLID MATERIAL TRANSPORT, HANDLING, AND STORAGE

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION	TR-2 BLOWPIPE
STACK DESCRIPTION	N/A
BUILDING DESCRIPTION	N/A
DATE INSTALLED OR LAST MODIFIED	1982
DATE LAST MODIFIED	ORIGINAL
MATERIAL DESCRIPTION	HOGGED FUEL

MATERIAL TRANSFER RATES

MAXIMUM HOURLY TRANSFER RATE (UNITS/HOUR)	See CALCS	TONS/HR
NORMAL HOURLY TRANSFER RATE (UNITS/HOUR)	See CALCS	TONS/HR
NORMAL ANNUAL TRANSFER RATE (UNITS/YEAR)	See CALCS	TONS/YR
UNIT OF MEASURE	BDT	

BELT CONVEYOR/VEHICLE TRANSFER

NUMBER OF TRANSFERS	N/A	MATERIAL MOISTURE CONTENT (WEIGHT PERCENT)		MAXIMUM HOURLY WIND SPEED (MPH)	
CONVEYORS ENCLOSED? (Y/N)		CONVEYORS IN BUILDINGS? (Y/N)		AVERAGE HOURLY WIND SPEED (MPH)	
TRANSFERS ENCLOSED? (Y/N)		TRANSFERS IN BUILDINGS? (Y/N)			

PNEUMATIC CONVEYOR TRANSFERS

MATERIAL MOISTURE CONTENT (WEIGHT PERCENT)	N/A		
PRIMARY SEPARATOR TYPE		PRIMARY SEPARATOR % EFFICIENCY	
SECONDARY SEPARATOR TYPE		SECONDARY SEPARATOR % EFFICIENCY	

MATERIAL STORAGE DATA

PILE? (Y/N)		STORAGE CAPACITY		PILE LENGTH (FT.)	
SILO? (Y/N)		STORAGE CAPACITY UNITS		PILE WIDTH (FT.)	
OTHER STORAGE TYPE DESCRIPTION				PILE HEIGHT (FT.)	

MATERIAL DATA

HAP DESCRIPTION	HAP CAS NUMBER	HAP FRACTION IN MATERIAL BY WEIGHT
NONE	N/A	N/A

SECTION 7, PART B

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER

DEC-FEB	25
MAR-MAY	25
JUN-AUG	25
SEP-NOV	25

OPERATING SCHEDULE SAME AS SAWMILL

HOURS/DAY	24
DAY/WEEK	5
WEEKS/YEAR	52

6240

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	PROPOSED TARGET BOX	
TYPE CODE (FROM APP. A)		
MANUFACTURER		
MODEL NUMBER		
PRESSURE DROP (IN. OF WATER)		
WET SCRUBBER FLOW (GPM)		
BAGHOUSE AIR/CLOTH RATIO (FPM)		

VENTILATION AND BUILDING/AREA DATA

ENCLOSED (Y/N)?	NO
HOOD TYPE (FROM APP. B)	N/A
MINIMUM FLOW (ACFM)	
PERCENT CAPTURE EFFICIENCY	0
BUILDING HEIGHT (FT)	N/A
BUILDING/AREA LENGTH (FT)	N/A
BUILDING/AREA WIDTH (FT)	N/A

STACK DATA

GROUND ELEVATION (FT)	1270.4 M
UTM X COORDINATE (KM)	548290
UTM Y COORDINATE (KM)	4977920
STACK TYPE (SEE NOTE BELOW)	01
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	23
STACK EXIT DIAMETER (FT)	
STACK EXIT GAS FLOWRATE (ACFM)	
STACK EXIT TEMPERATURE (DEG. F)	60

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	REFERENCE
PM		See CALCS	0	See CALCS	See CALCS	See CALCS	See CALCS
PM-10		See CALCS	0	See CALCS	See CALCS	See CALCS	See CALCS
SO2							
CO							
NOX							
VOC							
LEAD							
NONE							

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE
EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 7: SOLID MATERIAL TRANSPORT, HANDLING, AND STORAGE

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION	TRUCK TRANSFERS (3)
STACK DESCRIPTION	N/A
BUILDING DESCRIPTION	N/A
DATE INSTALLED OR LAST MODIFIED	1982
DATE LAST MODIFIED	ORIGINAL
MATERIAL DESCRIPTION	WOOD BY-PRODUCTS and ASH

MATERIAL TRANSFER RATES

MAXIMUM HOURLY TRANSFER RATE (UNITS/HOUR)	See CALCS	TONS/HR
NORMAL HOURLY TRANSFER RATE (UNITS/HOUR)	See CALCS	TONS/HR
NORMAL ANNUAL TRANSFER RATE (UNITS/YEAR)	See CALCS	TONS/YR
UNIT OF MEASURE	BDT	

BELT CONVEYOR/VEHICLE TRANSFER

NUMBER OF TRANSFERS	N/A	MATERIAL MOISTURE CONTENT (WEIGHT PERCENT)		MAXIMUM HOURLY WIND SPEED (MPH)	
CONVEYORS ENCLOSED? (Y/N)		CONVEYORS IN BUILDINGS? (Y/N)		AVERAGE HOURLY WIND SPEED (MPH)	
TRANSFERS ENCLOSED? (Y/N)		TRANSFERS IN BUILDINGS? (Y/N)			

PNEUMATIC CONVEYOR TRANSFERS

MATERIAL MOISTURE CONTENT (WEIGHT PERCENT)	N/A		
PRIMARY SEPARATOR TYPE		PRIMARY SEPARATOR % EFFICIENCY	
SECONDARY SEPARATOR TYPE		SECONDARY SEPARATOR % EFFICIENCY	

MATERIAL STORAGE DATA

PILE? (Y/N)		STORAGE CAPACITY		PILE LENGTH (FT.)	
SILO? (Y/N)		STORAGE CAPACITY UNITS		PILE WIDTH (FT.)	
OTHER STORAGE TYPE DESCRIPTION				PILE HEIGHT (FT.)	

MATERIAL DATA

HAP DESCRIPTION	HAP CAS NUMBER	HAP FRACTION IN MATERIAL BY WEIGHT
NONE	N/A	N/A

SECTION 7, PART B TR 3

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER

DEC-FEB	25
MAR-MAY	25
JUN-AUG	25
SEP-NOV	25

OPERATING SCHEDULE

HOURS/DAY	20	Same as sawmill
DAY/WEEK	6	6240
WEEKS/YEAR	52	

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	NONE	
TYPE CODE (FROM APP. A)		
MANUFACTURER		
MODEL NUMBER		
PRESSURE DROP (IN. OF WATER)		
WET SCRUBBER FLOW (GPM)		
BAGHOUSE AIR/CLOTH RATIO (FPM)		

VENTILATION AND BUILDING/AREA DATA

ENCLOSED (Y/N)?	NO
HOOD TYPE (FROM APP. B)	N/A
MINIMUM FLOW (ACFM)	N/A
PERCENT CAPTURE EFFICIENCY	0
BUILDING HEIGHT (FT)	N/A
BUILDING/AREA LENGTH (FT)	N/A
BUILDING/AREA WIDTH (FT)	N/A

STACK DATA

GROUND ELEVATION (FT)	4120
UTM X COORDINATE (KM)	548331
UTM Y COORDINATE (KM)	4977913
STACK TYPE (SEE NOTE BELOW)	05
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	9
STACK EXIT DIAMETER (FT)	N/A
STACK EXIT GAS FLOWRATE (ACFM)	ambient
STACK EXIT TEMPERATURE (DEG. F)	60

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	REFERENCE
PM		See CALCS	0	See CALCS	See CALCS	See CALCS	See CALCS
PM-10		See CALCS		See CALCS	See CALCS	See CALCS	See CALCS
SO2							
CO							
NOX							
VOC							
LEAD							
NONE							

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE
EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 7: SOLID MATERIAL TRANSPORT, HANDLING, AND STORAGE

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION: BIN UNLOADING

STACK DESCRIPTION: N/A

BUILDING DESCRIPTION: N/A

DATE INSTALLED OR LAST MODIFIED: 1982 DATE LAST MODIFIED: ORIGINAL

MATERIAL DESCRIPTION: WOOD BY-PRODUCTS

MATERIAL TRANSFER RATES

MAXIMUM HOURLY TRANSFER RATE (UNITS/HOUR): See CALCS TONS/HR

NORMAL HOURLY TRANSFER RATE (UNITS/HOUR): See CALCS TONS/HR

NORMAL ANNUAL TRANSFER RATE (UNITS/YEAR): See CALCS TONS/YR

UNIT OF MEASURE: BDT

BELT CONVEYOR/VEHICLE TRANSFER

NUMBER OF TRANSFERS: N/A

MATERIAL MOISTURE CONTENT (WEIGHT PERCENT):

MAXIMUM HOURLY WIND SPEED (MPH):

CONVEYORS ENCLOSED? (Y/N):

CONVEYORS IN BUILDINGS? (Y/N):

AVERAGE HOURLY WIND SPEED (MPH):

TRANSFERS ENCLOSED? (Y/N):

TRANSFERS IN BUILDINGS? (Y/N):

PNEUMATIC CONVEYOR TRANSFERS

MATERIAL MOISTURE CONTENT (WEIGHT PERCENT): N/A

PRIMARY SEPARATOR TYPE:

PRIMARY SEPARATOR % EFFICIENCY:

SECONDARY SEPARATOR TYPE:

SECONDARY SEPARATOR % EFFICIENCY:

MATERIAL STORAGE DATA

PILE? (Y/N): N

STORAGE CAPACITY:

PILE LENGTH (FT.):

SILO? (Y/N):

STORAGE CAPACITY UNITS:

PILE WIDTH (FT.):

OTHER STORAGE TYPE DESCRIPTION: OUT OF BIN

PILE HEIGHT (FT.):

MATERIAL DATA

HAP DESCRIPTION	HAP CAS NUMBER	HAP FRACTION IN MATERIAL BY WEIGHT
NONE	N/A	N/A

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER

DEC-FEB	25
MAR-MAY	25
JUN-AUG	25
SEP-NOV	25

OPERATING SCHEDULE

HOURS/DAY	24	SAME AS BOILER
DAY/WEEK	7	8400
WEEKS/YEAR	50	

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE		
TYPE CODE (FROM APP. A)		
MANUFACTURER		
MODEL NUMBER		
PRESSURE DROP (IN. OF WATER)		
WET SCRUBBER FLOW (GPM)		
BAGHOUSE AIR/CLOTH RATIO (FPM)		

VENTILATION AND BUILDING/AREA DATA

ENCLOSED (Y/N)?	NO
HOOD TYPE (FROM APP. B)	N/A
MINIMUM FLOW (ACFM)	AMBIENT
PERCENT CAPTURE EFFICIENCY	0
BUILDING HEIGHT (FT)	N/A
BUILDING/AREA LENGTH (FT)	N/A
BUILDING/AREA WIDTH (FT)	N/A

STACK DATA

GROUND ELEVATION (FT)	1271.7	M
UTM X COORDINATE (KM)	548430	
UTM Y COORDINATE (KM)	4978082	
STACK TYPE (SEE NOTE BELOW)		
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	14	
STACK EXIT DIAMETER (FT)		
STACK EXIT GAS FLOWRATE (ACFM)	AMBIENT	
STACK EXIT TEMPERATURE (DEG. F)	60	

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	REFERENCE
PM		See CALCS		See CALCS	See CALCS	See CALCS	See CALCS
PM-10		See CALCS		See CALCS	See CALCS	See CALCS	See CALCS
SO2							
CO							
NOX							
VOC							
LEAD							
NONE							

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE
EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 7: SOLID MATERIAL TRANSPORT, HANDLING, AND STORAGE

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION	OUTDOOR FUEL STORAGE PILE
STACK DESCRIPTION	N/A
BUILDING DESCRIPTION	N/A
DATE INSTALLED OR LAST MODIFIED	1982
DATE LAST MODIFIED	ORIGINAL
MATERIAL DESCRIPTION	Hogged Fuel

MATERIAL TRANSFER RATES

MAXIMUM HOURLY TRANSFER RATE (UNITS/HOUR)	See CALCS	TONS/HR
NORMAL HOURLY TRANSFER RATE (UNITS/HOUR)	See CALCS	TONS/HR
NORMAL ANNUAL TRANSFER RATE (UNITS/YEAR)	See CALCS	TONS/YR
UNIT OF MEASURE	BDT	

BELT CONVEYOR/VEHICLE TRANSFER

NUMBER OF TRANSFERS	N/A	MATERIAL MOISTURE CONTENT (WEIGHT PERCENT)		MAXIMUM HOURLY WIND SPEED (MPH)	
CONVEYORS ENCLOSED? (Y/N)		CONVEYORS IN BUILDINGS? (Y/N)		AVERAGE HOURLY WIND SPEED (MPH)	
TRANSFERS ENCLOSED? (Y/N)		TRANSFERS IN BUILDINGS? (Y/N)			

PNEUMATIC CONVEYOR TRANSFERS

MATERIAL MOISTURE CONTENT (WEIGHT PERCENT)	N/A		
PRIMARY SEPARATOR TYPE		PRIMARY SEPARATOR % EFFICIENCY	
SECONDARY SEPARATOR TYPE		SECONDARY SEPARATOR % EFFICIENCY	

MATERIAL STORAGE DATA

PILE? (Y/N)	Y	STORAGE CAPACITY	N/A	PILE LENGTH (FT.)	changes
SILO? (Y/N)	N	STORAGE CAPACITY UNITS	N/A	PILE WIDTH (FT.)	changes
OTHER STORAGE TYPE DESCRIPTION				PILE HEIGHT (FT.)	changes

MATERIAL DATA

HAP DESCRIPTION	HAP CAS NUMBER	HAP FRACTION IN MATERIAL BY WEIGHT
NONE	N/A	N/A

SECTION 7, PART B

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER

DEC-FEB	25
MAR-MAY	25
JUN-AUG	25
SEP-NOV	25

OPERATING SCHEDULE

HOURS/DAY	24
DAY/WEEK	7
WEEKS/YEAR	52

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	NONE	
TYPE CODE (FROM APP. A)		
MANUFACTURER		
MODEL NUMBER		
PRESSURE DROP (IN. OF WATER)		
WET SCRUBBER FLOW (GPM)		
BAGHOUSE AIR/CLOTH RATIO (FPM)		

VENTILATION AND BUILDING/AREA DATA

ENCLOSED (Y/N)?	NO
HOOD TYPE (FROM APP. B)	N/A
MINIMUM FLOW (ACFM)	N/A
PERCENT CAPTURE EFFICIENCY	0
BUILDING HEIGHT (FT)	N/A
BUILDING/AREA LENGTH (FT)	N/A
BUILDING/AREA WIDTH (FT)	N/A

STACK DATA

GROUND ELEVATION (FT)	4120
UTM X COORDINATE (KM)	548190
UTM Y COORDINATE (KM)	4977839
STACK TYPE (SEE NOTE BELOW)	05
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	N/A
STACK EXIT DIAMETER (FT)	N/A
STACK EXIT GAS FLOWRATE (ACFM)	N/A
STACK EXIT TEMPERATURE (DEG. F)	60

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	REFERENCE
PM		See CALCS	0	See CALCS	See CALCS	See CALCS	See CALCS
PM-10		See CALCS		See CALCS	See CALCS	See CALCS	See CALCS
SO2							
CO							
NOX							
VOC							
LEAD							
NONE							

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE
EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 7: SOLID MATERIAL TRANSPORT, HANDLING, AND STORAGE

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

PROCESS CODE OR DESCRIPTION	ST-3, 4 BY-PRODUCT STORAGE BINS
STACK DESCRIPTION	N/A
BUILDING DESCRIPTION	N/A
DATE INSTALLED OR LAST MODIFIED	1982
DATE LAST MODIFIED	original
MATERIAL DESCRIPTION	Sawdust and Chips

MATERIAL TRANSFER RATES

MAXIMUM HOURLY TRANSFER RATE (UNITS/HOUR)	See CALCS	TONS/HR
NORMAL HOURLY TRANSFER RATE (UNITS/HOUR)	See CALCS	TONS/HR
NORMAL ANNUAL TRANSFER RATE (UNITS/YEAR)	See CALCS	TONS/YR
UNIT OF MEASURE	BDT	

BELT CONVEYOR/VEHICLE TRANSFER

NUMBER OF TRANSFERS	N/A	MATERIAL MOISTURE CONTENT (WEIGHT PERCENT)		MAXIMUM HOURLY WIND SPEED (MPH)	
CONVEYORS ENCLOSED? (Y/N)	N	CONVEYORS IN BUILDINGS? (Y/N)		AVERAGE HOURLY WIND SPEED (MPH)	
TRANSFERS ENCLOSED? (Y/N)		TRANSFERS IN BUILDINGS? (Y/N)	N		

PNEUMATIC CONVEYOR TRANSFERS

MATERIAL MOISTURE CONTENT (WEIGHT PERCENT)	N/A		
PRIMARY SEPARATOR TYPE		PRIMARY SEPARATOR % EFFICIENCY	
SECONDARY SEPARATOR TYPE		SECONDARY SEPARATOR % EFFICIENCY	

MATERIAL STORAGE DATA

PILE? (Y/N)		STORAGE CAPACITY		PILE LENGTH (FT.)	
SILO? (Y/N)		STORAGE CAPACITY UNITS		PILE WIDTH (FT.)	
OTHER STORAGE TYPE DESCRIPTION	BINS			PILE HEIGHT (FT.)	

MATERIAL DATA

HAP DESCRIPTION	HAP CAS NUMBER	HAP FRACTION IN MATERIAL BY WEIGHT
NONE	N/A	N/A

SECTION 7, PART B ST 3, 4

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER		OPERATING SCHEDULE	Same as sawmiill
DEC-FEB	25	HOURS/DAY	20
MAR-MAY	25	DAY/WEEK	6
JUN-AUG	25	WEEKS/YEAR	52
SEP-NOV	25		

6240

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	NONE	
TYPE CODE (FROM APP. A)		
MANUFACTURER		
MODEL NUMBER		
PRESSURE DROP (IN. OF WATER)		
WET SCRUBBER FLOW (GPM)		
BAGHOUSE AIR/CLOTH RATIO (FPM)		

VENTILATION AND BUILDING/AREA DATA

ENCLOSED (Y/N)?	NO
HOOD TYPE (FROM APP. B)	N/A
MINIMUM FLOW (ACFM)	N/A
PERCENT CAPTURE EFFICIENCY	0
BUILDING HEIGHT (FT)	N/A
BUILDING/AREA LENGTH (FT)	N/A
BUILDING/AREA WIDTH (FT)	N/A

STACK DATA

GROUND ELEVATION (FT)	1259.8
UTM X COORDINATE (KM)	548429.6
UTM Y COORDINATE (KM)	4978088
STACK TYPE (SEE NOTE BELOW)	05
STACK EXIT HEIGHT FROM GROUND LEVEL (FT)	35
STACK EXIT DIAMETER (FT)	N/A
STACK EXIT GAS FLOWRATE (ACFM)	N/A
STACK EXIT TEMPERATURE (DEG. F)	60

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	REFERENCE
PM		See CALCS	0	See CALCS	See CALCS	See CALCS	See CALCS
PM-10		See CALCS		See CALCS	See CALCS	See CALCS	See CALCS
SO2							
CO							
NOX							
VOC							
LEAD							
NONE							

NOTE: STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE
EMISSION FACTOR IN LBS/UNITS. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 8: FUGITIVE ROAD DUST SOURCES

DEQ USE ONLY

DEQ PLANT ID CODE		DEQ PROCESS CODE		DEQ STACK ID CODE	
DEQ BUILDING CODE		PRIMARY SCC		SECONDARY SCC	
DEQ SEGMENT CODE					

PART A: GENERAL INFORMATION

ROAD DESCRIPTION: REFER TO CALCS

PAVED? (Y/N): N

LENGTH (FT.):

WIDTH (FT.):

BEGINNING COORDINATES UTM-X (KM)	BEGINNING COORDINATES UTM-Y (KM)	END COORDINATES UTM-X (KM)	END COORDINATES UTM-Y (KM)

DATA FOR ALL ROADS - PAVED AND UNPAVED

VEHICLE DESCRIPTION	NUMBER OF ROUNDTRIPS PER DAY	VEHICLE MILES TRAVELED PER DAY	NUMBER OF DAYS PER YEAR USED	AVERAGE VEHICLE SPEED (MPH)	SURFACE SILT CONTENT (% WEIGHT)
REFER TO CALCS					

VEHICLE DESCRIPTION	VEHICLE EMPTY WEIGHT (TONS)	VEHICLE FULL WEIGHT TONS
REFER TO CALCS		

DATA: UNPAVED ROADS

NUMBER OF WHEELS PER VEHICLE	NUMBER OF DAYS >0.01 INCHES PRECIPITATION

DATA: PAVED ROADS

NUMBER OF LANES	INDUSTRIAL AUGMENTATION FACTOR	DUST LOADING (LB/MILE)

ROAD DUST CHEMICAL DATA

HAP DESCRIPTION	HAP CAS NUMBER	HAP FRACTION IN ROAD DUST BY WEIGHT
NONE		

SECTION 8, PART B

OPERATING DATA

PERCENT FUEL CONSUMPTION PER QUARTER		OPERATING SCHEDULE	
DEC-FEB	10	HOURS/DAY	9
MAR-MAY	20	DAY/WEEK	5
JUN-AUG	35	WEEKS/YEAR	36
SEP-NOV	35		

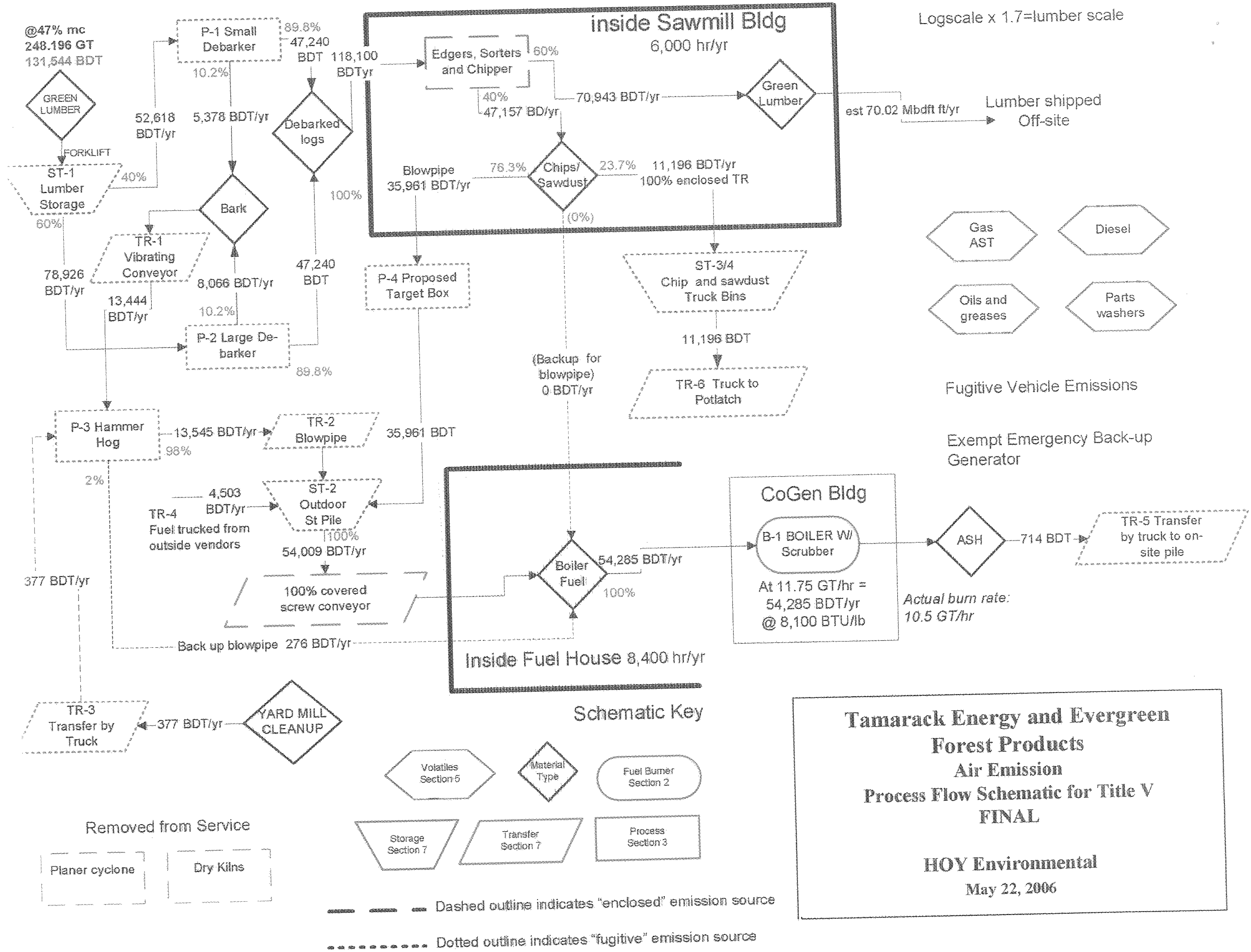
FUGITIVE DUST CONTROL DATA

PARAMETER	PRIMARY	SECONDARY
CONTROL DESCRIPTION	WATER TRUCK	
CONTROL CODE (APPENDIX A)	61	
MINIMUM DAILY APPLICATIONS OF CONTROL	2	
MAXIMUM DAILY APPLICATIONS OF CONTROL	2	
AVERAGE ANNUAL APPLICATIONS OF CONTROL	300	
AMOUNT APPLIED (UNITS/APPLICATION)	0.01	
UNITS FOR APPLICATION AMOUNT	IN	

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (LBS/HR)	ALLOWABLE EMISSIONS (TONS/YR)	ALLOWABLE EMISSIONS REFERENCE
PM		CALCs				CALCs	
PM-10		CALCs				CALCs	
LEAD		N/A					
N/A	N/A						

SECTION 3



Tamarack Energy and Evergreen Forest Products
Air Emission
Process Flow Schematic for Title V
FINAL

HOY Environmental
May 22, 2006

TAMARACK ENERGY -THE BALANCING ACT - Permit App May 2006

Scene 1- Convert everything into BDT.

Assume:

80	Projected lumber production (M Bdft)	GT = BDT/(1-mc)
151%	% production compared to 2005 actual	BDT= GT x (1-mc)
1666.5	G ton/Mbft log scale	
933.2	BDT/Mbft lu scale gr lumber	Data balanced from 2005 quantities
8,400	Boiler hrs	Increased to represent permit requested max
6,240	Mill hrs	Informational only

		MBF	mc	GT	BDT		
Permit requersted max: raw logs into sawmill in 2005			0.47	248,196	131,544		
Requested operating hours in 2005:	(24 hrs/day, 50 wks/yr) Boiler				8,400	hrs/hr	46% raw log is waste
	(2-10 shifts, 6 days/wk, 50 wks/yr) Sawmill				6,240	hrs/yr	
Fuel BTU consumption:			0.5	98,700	49,350	BDT/yr	
					8,100	BTU/BD lb from latest Mill data	
					799,470	MBTU/yr	
					95	MBTU/hr	
Boiler ash produced:	(170 lbs/hr)				714	TR-9	
Estimated Fuel to be purchased:			0.25	28,927	21,695		
Loads shipped to Potlatch			0.48	21,531	11,196		

Scene 2- Make sure everything that goes into the mill.. is accounted for in what goes out.

		MBF	mc	GT	BDT		
						@ tons/hr:	11.75
out of mill	used as fuel		0.45	98,700	54,285	98,700 GT	
	Sawdust and chips sold to Potlatch		0.48	21,531	11,196	(Note: lower BTU in future, but higher volume and	
	Estimated Sold lumber (based on calcs)	76.02		6,082	70,943		
				BDTs out:	136,424		
	reclaimed yard cleanup material		0.50	755	377	estimated TR-4	
	fuel purchased from vendors	(need<'05 since producing more)	0.25	28,927	4,503		
	logs		0.47	248,196	131,544	ST-1	
				BDT in:	136,424		

Notes:

		mc	BDT
	Sawdust and chips NOT sold to Potlatch (but used as fuel)	0.50	35,961

Scene 3- Assign Qtys to equipment going forward

		mc	GT	BDT		
From Lumber Storage				131,544		
	Goes into small debarker	0.4	99,278	52,618	P-1	
	Goes into large debarker	0.6	148,918	78,926	P-2	
				52,618		
From small debarker into waste wood		0.1022		5,378		
				78,926		
From large debarker into waste wood		0.1022		8,066		
Total bark waste	From large debarker		8,066			
	From small debarker		5,378			
				13,444	TR-1	
Total weight of debarked logs				52,618		
	From small debarker	0.898		47,240		47,240
				78,926		
	From large debarker	0.898		70,860		70,860
						118,100
Weight going into sawmill:				118,100		
	Turns into chips/sawdust	40%		47,157		
	Turns into green lumber	60%		70,943	# MBdft OK ??	
						76.02 Mbdft - OK
Chips and sawdust go to:				47,157		
	To blowpipe and outdoor storage	0.763		35,961	P-4	
	Sawdust and chip truck bins and onto Potlatch	0.237		11,196		
	Back up blowpipe direct to boiler fuel	0.000		0		
		0.00				
Chips and sawdust from sawmill:						
	From Sawmill			11,196	ST-3/4	
	Into TR-6		1.00	11,196	TR-6	
Goes into Hammer Hog						
	From small debarker			5,378		
	From large debarker			8,066		
	From log yard cleanup			377	TR-3	
		P-3	26,078	13,821		
Leaves Hammer Hog		TR-8		13,821		
	Blowpipe to Boiler	553	0.02	276		
	To outdoor storage pile		0.98	13,545	P-4, TR-2	
Total going into outdoor storage pile						
	From Hammer hog			13,545		
	Purchased Fuel	0.25	28,927	4,503	TR-4	
	From sawmill (chips and sawdust)			35,961		
		0.40	90,014	54,009		
			ST-2			
Going into boiler:	From outdoor storage pile			54,009	TR-7	
	From Hammer Hog			276		
	From backup blowpipe of mill			0		
				54,285	B-1	
					Needs to be to match	54,285

SECTION 4

PROJECTED ANNUAL EMISSION ESTIMATES

Red font: Comes from "Balance" calculation page
Blue font" Comes from Tank VOC calculation page

MILL PRODUCTION
(Unless otherwise shown, Assume all PM is PM10)

76 MBF

FUGITIVE SOURCES:

Source	% moisture or Notes	PM E.F.	PM10 E.F.	VOC E.F.	CO E.F.	NOX E.F.	SOx E.F.	HAPs E.F.	New Permit	Units	PM Emiss	PM10 Emiss	VOC Emiss	CO Emiss	NOx Emiss	SOx Emiss	HAP Emiss
BLOWPIPES																	
TR-2 (from hog to outdr pile) (assume PM10 is 50% of PM)	Yanke/ODEQ	0.62	0.31	-	-	-	-	-	13,545	BDT/yr	4.20	2.10	NA	NA	NA	NA	NA
TR-7 (New blowpipe to boiler w/target box)	See P-4	NA	NA	-	-	-	-	-	refer to P-4	BDT/yr	NA	NA	NA	NA	NA	NA	NA
										subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00** #
TRANSFERS																	
TR-1 Vibrating conveyor	Yanke/EPA AP-42	1.93E-05	1.93E-05	-	-	-	-	-	13,444	BDT/yr	1.30E-04	1.30E-04	NA	NA	NA	NA	NA
TR-3 Truck transfer of mill cleanup	Same as TR-4	7.03E-05	7.03E-05	-	-	-	-	-	377	BDT/yr	1.33E-05	1.33E-05	NA	NA	NA	NA	NA
TR-4 Trucked in fuel	Yanke/EPA AP-42	7.03E-05	7.03E-05	-	-	-	-	-	4,503	BDT/yr	1.58E-04	1.58E-04	NA	NA	NA	NA	NA
TR-5 Truck transfer to ash pile (est)	Yanke/EPA AP-42	3.52E-03	3.52E-03	-	-	-	-	-	715	BDT/yr	1.26E-03	1.26E-03	NA	NA	NA	NA	NA
TR-6 Bin to truck transfer to Potlatch	IDEQ w/Yanke 50% eff	1.00	0.60	-	-	-	-	-	11,196	BDT/yr	5.60	3.36	NA	NA	NA	NA	NA
										subtotal	**5.60**	**3.36**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
STORAGE																	
ST-1 Lumber Storage	0.50	0.00	0.00	-	-	-	-	-	131,544	BDT/yr	0.00	0.00	NA	NA	NA	NA	NA
ST-2 Outdoor stg pile	Yanke/EPA AP-42	4.86E-06	4.86E-06	-	-	-	-	-	90,014	Green tons/yr	0.00	0.00	NA	NA	NA	NA	NA
ST-3/4 and Sawdust & Chip Truck bins	IDEQ	1.00	0.58	-	-	-	-	-	11,196	BDT/yr	5.60	3.25	NA	NA	NA	NA	NA
										subtotal	**5.60**	**3.25**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VOLATILE																	
V1 gasoline	NA	NA	NA	tank calcs	-	-	-	-	120,000	Gal/yr	NA	NA	0.05	NA	NA	NA	NA
V2 Diesel	NA	NA	NA	tank calcs	-	-	-	-	118,000	Gal/yr	NA	NA	1.19	NA	NA	NA	NA
V3 Parts washers	NA	NA	NA	estim	-	-	-	-	NA	Gal/yr	NA	NA	0.01	NA	NA	NA	NA
V4 Lube/oil	NA	NA	NA	0.00	-	-	-	-	NA	Gal/yr	NA	NA	0.00	NA	NA	NA	NA
										subtotal	**0.00**	**0.00**	**1.25**	**0.00**	**0.00**	**0.00**	**0.00**
PROCESS																	
P-1 Small Debarker (fugitive)	NA	0.024	0.011	-	-	-	-	-	99,278	G tons logs/yr	1.19	0.55	NA	NA	NA	NA	NA
P-2 Large Debarker (fugitive)	NA	0.024	0.011	-	-	-	-	-	148,918	G tons logs/yr	1.79	0.82	NA	NA	NA	NA	NA
P-3 Hammer Hog (fugitive)	NA	0.024	0.011	-	-	-	-	-	26,078	G tons/yr	0.31	0.14	NA	NA	NA	NA	NA
P-4 Proposed target box (fugitive)	NA	0.1	0.05	-	-	-	-	-	35,961	BDT/yr	1.80	0.90	NA	NA	NA	NA	NA
										subtotal	**5.09**	**2.41**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
ROADS																	
Fugitive (refer to road calcs tab)	NA	NA	NA	-		-	-	-	NA	BDT/yr	7.04	6.56	NA	NA	NA	NA	NA
										subtotal	**7.04**	**6.56**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
										FUGITIVE SUBTOTALS (t/yr)	**23.33**	**15.57**	**1.25**	**0.00**	**0.00**	**0.00**	**0.00**

POINT SOURCES:

WOOD FIRED SPREADER STOKER BOILER 450 PSIG, 750 *FTT

Note: All EF possibilites listed, used only worst case scenario in emission calculations - in **bold**)

BOILER	% moisture or Notes	PM E.F.	PM10 E.F.	VOC E.F.	CO E.F.	NOX E.F.	SOx E.F.	HAPs E.F.	New Permit	Units	PM	PM10	VOC	CO	NOx	SOx	HAP
Particulate (AP42 Table 1.6-1 9/03) *	NA	0.083	0.065		-	-	-	-	799,470	MBTU/yr	**33.18**	**25.98**	NA	NA	NA	NA	NA
Particulate , May 2002 (no steam rate)	NA	*6.01*	*NA*		-	-	-	-	8,400	hours	*25.24*	NA	*NA*	*NA*	*NA*	*NA*	*NA*
VOC (AP42 1.6-3)	NA	-	-	0.017	-	-	-	-	799,470	MBTU/yr	NA	NA	**6.80**	NA	NA	NA	NA
CO (AP42 1.6)	NA	-	-	-	*0.60*	-	-	-	*799,470*	*MBTU/yr*	*NA*	*NA*	*NA*	*239.84*	*NA*	NA	NA
CO (June 2002 source test @ 67,120 pph)	NA	-	-	-	*29.9*	-	-	-	*8,400*	*hours*	*NA*	*NA*	*NA*	*125.58*	NA	NA	NA
CO 12/1/93 Source test - Wood only	NA	-	-	-	*57.6*	-	-	-	*8,400*	*Hours*	*NA*	*NA*	*NA*	***241.92***	*NA*	*NA*	*NA*
NOx (AP42 1.6-2)	NA	-	-	-	-	0.22	-	-	799,470	MBTU/yr	NA	NA	NA	NA	**87.9**	NA	NA
NOx (June 2002 source test @ 67,120 pph)	NA	-	-	-	-	19.29	-	-	8,400	hours	NA	NA	NA	NA	*81.0*	NA	NA
SOx (AP42 1.6-2)	NA	-	-	-	-	-	0.025	-	799,470	MBTU/yr	NA	NA	NA	NA	NA	**10.0**	NA
SOx 12/1/93 Source test - Wood only	NA	-	-	-	-	-	0.2	-	8,400	hours	NA	NA	NA	NA	NA	0.8	NA
HAPs (AP42 1.6-3)	NA	-	-	-	-	-	-	(HAPs sht)	799,470	MBTU/yr	NA	NA	NA	NA	NA	NA	23.76
										BOILER MAX SUBTOTALS (t/yr)	**33.2**	**26.0**	**6.8**	**241.9**	**87.9**	**10.0**	**23.8**

* Includes condensible PM (.066+.017 = .083)

COOLING TOWER		PM	PM10														
Particulate (lb/hr)			0.0682227						8,400	hours/yr	NA	0.29	NA	NA	NA	NA	NA
Potassium Hydroxide (Solubility =100%)								0.003424	8,400	hours/yr	NA	NA	NA	NA	NA	NA	0.014
HCL								7.32E-05	8,400	hours/yr	NA	NA	NA	NA	NA	NA	0.0003
										Cooling Tower Totals	**0.0**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.014**

Deminimus

Deminimus
Conveyor drops
Back up generator

	PM	PM10	VOC	CO	NOx	SOx	HAP
SITE WIDE TOTALS (t/yr)	56.5	41.8	8.0	241.9	87.9	10.0	23.8

PROJECTED HOURLY EMISSIONS

6,240 Sawmill
6,400 Boiler

	Op Hrs Hrs/yr	PM Emiss	PM10 Emiss	VOC Emiss	CO Emiss	NOx Emiss	SOx Emiss	HAP Emiss
		Hourly EMISSIONS						

FUGITIVE SOURCES:

	Op Hrs Hrs/yr	PM Emiss	PM10 Emiss	VOC Emiss	CO Emiss	NOx Emiss	SOx Emiss	HAP Emiss
BLOWPIPES								
TR-2 (from hog to outdoor pile)	6,240	1.346	0.673	NA	NA	NA	NA	NA
TR-7 (New blowpipe to boiler w/target box)	8,400	NA	NA	NA	NA	NA	NA	NA
		0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	0.00
TRANSFERS (Unless otherwise shown, Assume all PM is PM10)								
TR-1 Vibrating conveyor	6,240	4.158E-05	4.158E-05	NA	NA	NA	NA	NA
TR-3 Truck transfer of mill cleanup	6,240	4.251E-06	4.251E-06	NA	NA	NA	NA	NA
TR-4 Trucked in fuel	6,240	5.073E-05	5.073E-05	NA	NA	NA	NA	NA
TR-5 Truck transfer to ash pile (est)	100	2.517E-02	2.517E-02	NA	NA	NA	NA	NA
TR-6 Bin to truck transfer to Potlatch	8,400	1.333E+00	7.997E-01	NA	NA	NA	NA	NA
		1.36	**0.82**	**0.00**	**0.00**	**0.00**	**0.00**	0.00
STORAGE								
ST-1 Lumber Storage	8,760	0.000	0.000	NA	NA	NA	NA	NA
ST-2 Outdoor storage pile	8,760	0.000	0.000	NA	NA	NA	NA	NA
ST-3/4 and Sawdust & Chip Truck bins	6,240	1.794	1.041	NA	NA	NA	NA	NA
		1.79	**1.04**	**0.00**	**0.00**	**0.00**	**0.00**	0.00
VOLATILE								
V1 gasoline	8,760	NA	NA	0.01	NA	NA	NA	NA
V2 Diesel	8,760	NA	NA	0.27	NA	NA	NA	NA
V3 Parts washers	8,760	NA	NA	0.00	NA	NA	NA	NA
V4 Lube/oil	8,760	NA	NA	0.00	NA	NA	NA	NA
		0.00	**0.00**	**0.28**	**0.00**	**0.00**	**0.00**	0.00
PROCESS								
P-1 Small Debarker (fugitive)	6,240	NA	NA	NA	NA	NA	NA	NA
P-2 Large Debarker (fugitive)	6,240	0.57	0.26	NA	NA	NA	NA	NA
P-3 Hammer Hog (fugitive)	6,240	0.10	0.05	NA	NA	NA	NA	NA
P-4 Proposed target box (fugitive)	6,240	0.58	0.29	NA	NA	NA	NA	NA
		1.25	**0.60**	**0.00**	**0.00**	**0.00**	**0.00**	0.00
ROADS								
Fugitive (refer to road calcs tab)	8,760	1.61	1.50	9.13	NA	NA	NA	NA
		1.61	**1.50**	**9.13**	**0.00**	**0.00**	**0.00**	0.00
FUGITIVE SUBTOTALS (t/yr)		**6.01**	**3.96**	**9.42**	**0.00**	**0.00**	**0.00**	

POINT SOURCES:

Note: All EF possibilites listed, used only worst case scenario in emission calculations - in **bold**)

BOILER w/ AP42		PM	PM10	VOC	CO	NOx	SOx	HAP
Particulate (AP42 Table 1.6-1 9/03) *	8,400	**7.90**	**6.19**	NA	NA	NA	NA	NA
Particulate, May 2002 (no steam rate)	*8,400*	6.01	NA	NA	NA	NA	NA	NA
VOC (AP42 1.6-3)	8,400	NA	NA	**1.62**	NA	NA	NA	NA
CO (AP42 1.6)	8,400	NA	NA	NA	57.11	NA	NA	NA
CO (June 2002 source test @ 67,120 pph)	8,400	NA	NA	NA	29.90	NA	NA	NA
CO 12/1/93 Source test - Wood only	*8,400*	NA	NA	NA	**57.60**	NA	NA	NA
NOx (AP42 1.6-2)	8,400	NA	NA	NA	NA	**20.94**	NA	NA
NOx (June 2002 source test @ 67,120 pph)	8,400	NA	NA	NA	NA	19.29	NA	NA
SOx (AP42 1.6-2)	8,400	NA	NA	NA	NA	NA	**2.38**	NA
SOx 12/1/93 Source test - Wood only	8,400	NA	NA	NA	NA	NA	0.20	NA
HAPs (AP42 1.6-3)	8,400	NA	NA	NA	NA	NA	NA	**5.66**
BOILER MAX SUBTOTALS (t/yr)		**7.9**	**6.2**	**1.6**	**57.6**	**20.9**	**2.4**	**5.7**
COOLING TOWER								
Particulate (lb/hr)	8,400	NA	**0.07**	NA	NA	NA	NA	NA
Potassium Hydroxide (Solubility =100%)	8,400	NA	NA	NA	NA	NA	NA	**0.003**
HCL	8,400	NA	NA	NA	NA	NA	NA	**0.0001**
Cooling Tower Totals		**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.003**

* Includes condensible PM (.066+.017 = .083)

	PM	PM	PM10	VOC	CO	NOx	HAP
SITE WIDE TOTALS (lb/hr)	13.9	10.2	11.0	57.6	20.9	2.4	5.7

PROJECTED MAXIMUM HOURLY EMISSIONS

Max Hrly emissions (10% higher)

FUGITIVE SOURCES:

	PM Emiss	PM10 Emiss	VOC Emiss	CO Emiss	NOx Emiss	SOx Emiss	HAP Emiss
BLOWPIPES							
TR-2 (from hog to outdoor pile)	1.480	0.740	NA	NA	NA	NA	NA
TR-7 (New blowpipe to boiler w/target box)	NA	NA	NA	NA	NA	NA	NA
	1.48	**0.74**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
TRANSFER (Unless otherwise shown, Assume all PM is PM10)							
TR-1 Vibrating conveyor	4.57E-05	4.57E-05	NA	NA	NA	NA	NA
TR-3 Truck transfer of mill cleanup	4.68E-06	4.68E-06	NA	NA	NA	NA	NA
TR-4 Trucked in fuel	5.58E-05	5.58E-05	NA	NA	NA	NA	NA
TR-5 Truck transfer to ash pile (est)	2.77E-02	2.77E-02	NA	NA	NA	NA	NA
TR-6 Bin to truck transfer to Potlatch	1.47E+00	8.80E-01	NA	NA	NA	NA	NA
	1.49	**0.91**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
STORAGE							
ST-1 Lumber Storage	0.000	0.000	NA	NA	NA	NA	NA
ST-2 Outdoor storage pile	0.000	0.000	NA	NA	NA	NA	NA
ST-3/4 and Sawdust & Chip Truck bins	1.974	1.145	NA	NA	NA	NA	NA
	1.97	**1.14**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VOLATILE							
V1 gasoline	NA	NA	0.013	NA	NA	NA	NA
V2 Diesel	NA	NA	0.325	NA	NA	NA	NA
V3 Parts washers	NA	NA	0.003	NA	NA	NA	NA
V4 Lube/oil	NA	NA	0.000	NA	NA	NA	NA
	0.00	**0.00**	**0.34**	**0.00**	**0.00**	**0.00**	**0.00**
PROCESS							
P-1 Small Debarker (fugitive)	NA	NA	NA	NA	NA	NA	NA
P-2 Large Debarker (fugitive)	0.630	0.289	NA	NA	NA	NA	NA
P-3 Hammer Hog (fugitive)	0.110	0.051	NA	NA	NA	NA	NA
P-4 Proposed target box (fugitive)	0.634	0.317	NA	NA	NA	NA	NA
	1.37	**0.66**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
ROADS							
Fugitive (refer to road calcs tab)	1.768	1.646	NA	NA	NA	NA	NA
	1.77	**1.65**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	8.09	**5.10**	**0.34**	**0.00**	**0.00**	**0.00**	**0.00**

POINT SOURCES:

Note: All EF possibilites listed, used only worst case scenario in emission calculations - in **bold**)

	PM	PM10	VOC	CO	NOx	SOx	HAP
BOILER w/ AP42							
Particulate (AP42 Table 1.6-1 9/03) *	**8.69**	**6.81**	NA	NA	NA	NA	NA
Particulate , May 2002 (no steam rate)	6.61	NA	NA	NA	NA	NA	NA
VOC (AP42 1.6-3)	NA	NA	**1.78**	NA	NA	NA	NA
CO (AP42 1.6)	NA	NA	NA	62.82	NA	NA	NA
CO (June 2002 source test @ 67,120 pph)	NA	NA	NA	32.89	NA	NA	NA
CO 12/1/93 Source test - Wood only	NA	NA	NA	**63.36**	NA	NA	NA
NOx (AP42 1.6-2)	NA	NA	NA	NA	**23.03**	NA	NA
NOx (June 2002 source test @ 67,120 pph)	NA	NA	NA	NA	21.22	NA	NA
SOx (AP42 1.6-2)	NA	NA	NA	NA	NA	**2.62**	NA
SOx 12/1/93 Source test - Wood only	NA	NA	NA	NA	NA	0.22	NA
HAPs (AP42 1.6-3)	NA	NA	NA	NA	NA	NA	**6.22**
	8.7	**6.8**	**1.8**	**63.4**	**23.0**	**2.6**	**6.2**
COOL TOWER							
Particulate (lb/hr)	NA	**0.08**	NA	NA	NA	NA	NA
Potassium Hydroxide (Solubility =100%)	NA	NA	NA	NA	NA	NA	0.004
HCL	NA	NA	NA	NA	NA	NA	0.0001
Cooling Tower Totals	**0.0**	**0.08**	**0.0**	**0.0**	**0.0**	**0.0**	**0.004**

	PM	PM	PM10	VOC	CO	NOx	HAP
SITE WIDE TOTALS max(lb/hr)	16.8	12.0	2.1	63.4	23.0	2.6	6.2

Burner HAP Emissions

EF's from AP2 Table 1.6-3 updated 9/03

Hr/year: 8,400

mm BTU/year 799,470

Pollutant	Emission Factor (lbs/unit)	Throughput	Units	Regs EL (lb/hr) 585	Regs EL (lb/hr) 586	Max. Emissions (lb/hr) (10% more than max)	Avg. Emissions (lb/hr)	Emissions (tons/yr)
Acenaphthene	9.1E-07	799,470	lbs/10^6 Btu	NA	NA	9.53E-05	8.66E-05	3.638E-04
Acenaphthylene	5.0E-06	799,470	lbs/10^6 Btu	NA	NA	5.23E-04	4.76E-04	1.999E-03
Acetaldehyde	8.3E-04	799,470	lbs/10^6 Btu	NA	3.00E-03	8.69E-02	7.90E-02	3.318E-01
Acrolein	4.0E-03	799,470	lbs/10^6 Btu	1.70E-02	NA	4.19E-01	3.81E-01	1.599E+00
Anthracene	3.0E-06	799,470	lbs/10^6 Btu	NA	NA	3.14E-04	2.86E-04	1.199E-03
Benzaldehyde	8.5E-07	799,470	lbs/10^6 Btu	NA	NA	8.90E-05	8.09E-05	3.398E-04
Benzene	4.2E-03	799,470	lbs/10^6 Btu	NA	8.40E-04	4.40E-01	4.00E-01	1.679E+00
Benzo (a) pyrene	2.6E-06	799,470	lbs/10^6 Btu	NA	2.60E-06	2.72E-04	2.47E-04	1.039E-03
Benzo anthracene	6.5E-08	799,470	lbs/10^6 Btu	NA	NA	6.81E-06	6.19E-06	2.598E-05
Benzo (j,k)fluoranthene	1.6E-07	799,470	lbs/10^6 Btu	NA	NA	1.68E-05	1.52E-05	6.396E-05
Benzo perylene	9.3E-08	799,470	lbs/10^6 Btu	NA	NA	9.74E-06	8.85E-06	3.718E-05
Benzo pyrene	2.6E-09	799,470	lbs/10^6 Btu	NA	NA	2.72E-07	2.47E-07	1.039E-06
Benzoic acid	4.7E-08	799,470	lbs/10^6 Btu	NA	NA	4.92E-06	4.47E-06	1.879E-05
Bis phthalate	4.7E-08	799,470	lbs/10^6 Btu	NA	2.80E-02	4.92E-06	4.47E-06	1.879E-05
Bromomethane	1.5E-05	799,470	lbs/10^6 Btu	NA	NA	1.57E-03	1.43E-03	5.996E-03
2-Butanone (MEK)	5.4E-06	799,470	lbs/10^6 Btu	39.3	NA	5.65E-04	5.14E-04	2.159E-03
Carbazole	1.8E-06	799,470	lbs/10^6 Btu	NA	NA	1.88E-04	1.71E-04	7.195E-04
Carbon Tetra Chloride	4.5E-05	799,470	lbs/10^6 Btu	NA	4.40E-04	4.71E-03	4.28E-03	1.799E-02
Chlorine	7.9E-04	799,470	lbs/10^6 Btu	0.2	NA	8.27E-02	7.52E-02	3.158E-01
Chlorobenzene	3.3E-05	799,470	lbs/10^6 Btu	23.3	NA	3.45E-03	3.14E-03	1.319E-02
Chloroform	2.8E-05	799,470	lbs/10^6 Btu	NA	2.80E-04	2.93E-03	2.66E-03	1.119E-02
Chloromethane	2.3E-05	799,470	lbs/10^6 Btu	NA	NA	2.41E-03	2.19E-03	9.194E-03
2-Chloronapthalene	2.4E-09	799,470	lbs/10^6 Btu	NA	NA	2.51E-07	2.28E-07	9.594E-07
2-Chlorophenol	2.4E-08	799,470	lbs/10^6 Btu	0.033	NA	2.51E-06	2.28E-06	9.594E-06
Chrysene	3.8E-08	799,470	lbs/10^6 Btu	NA	NA	3.98E-06	3.62E-06	1.519E-05
Crotonaldehyde	9.9E-06	799,470	lbs/10^6 Btu	0.38	NA	1.04E-03	9.42E-04	3.957E-03
Decachlorobiphenyl	2.7E-10	799,470	lbs/10^6 Btu	NA	NA	2.83E-08	2.57E-08	1.079E-07
Dibenzo (a,h)anthracene	9.1E-09	799,470	lbs/10^6 Btu	NA	NA	9.53E-07	8.66E-07	3.638E-06
1,2-Dichloromethane	2.9E-05	799,470	lbs/10^6 Btu	NA	NA	3.04E-03	2.76E-03	1.159E-02
Dichlorobiphenyl	7.4E-10	799,470	lbs/10^6 Btu	NA	NA	7.75E-08	7.04E-08	2.958E-07
1,2-Dichloroethane	2.9E-05	799,470	lbs/10^6 Btu	NA	NA	3.04E-03	2.76E-03	1.159E-02
1,2-Dichloropropane	3.3E-05	799,470	lbs/10^6 Btu	23.133	NA	3.45E-03	3.14E-03	1.319E-02
2,4-Dinitrophenol	1.8E-07	799,470	lbs/10^6 Btu	NA	NA	1.88E-05	1.71E-05	7.195E-05
Ethylbenzene	3.1E-05	799,470	lbs/10^6 Btu	29	NA	3.25E-03	2.95E-03	1.239E-02
Fluoranthene	1.6E-06	799,470	lbs/10^6 Btu	NA	NA	1.68E-04	1.52E-04	6.396E-04
Fluorene	3.4E-06	799,470	lbs/10^6 Btu	1.33E-01	NA	3.56E-04	3.24E-04	1.359E-03
Formaldehyde	4.4E-03	799,470	lbs/10^6 Btu	NA	5.10E-04	4.61E-01	4.19E-01	1.759E+00
Heptachlorobiphenyl	6.6E-11	799,470	lbs/10^6 Btu	NA	NA	6.91E-09	6.28E-09	2.638E-08
Hexachlorobiphenyl	5.5E-10	799,470	lbs/10^6 Btu	NA	NA	5.76E-08	5.23E-08	2.199E-07
Hexanal	7.0E-06	799,470	lbs/10^6 Btu	NA	NA	7.33E-04	6.66E-04	2.798E-03
Heptachlorodibenzo-p-dioxins	2.0E-09	799,470	lbs/10^6 Btu	NA	NA	2.09E-07	1.90E-07	7.995E-07
Heptachlorodibenzo-p-furans	2.4E-10	799,470	lbs/10^6 Btu	NA	NA	2.51E-08	2.28E-08	9.594E-08
Hexachlorodibenzo-p-dioxins	1.6E-06	799,470	lbs/10^6 Btu	NA	NA	1.68E-04	1.52E-04	6.396E-04
Hexachlorodibenzo-p-furans	2.8E-10	799,470	lbs/10^6 Btu	NA	NA	2.93E-08	2.66E-08	1.119E-07
Hydrogen chloride	1.9E-02	799,470	lbs/10^6 Btu	0.05	NA	1.99E+00	1.81E+00	7.595E+00

Indeno pyrene	8.7E-08	799,470	lbs/10^6 Btu	NA	NA	9.11E-06	8.28E-06	3.478E-05
Isobutyaldehyde	1.2E-05	799,470	lbs/10^6 Btu	NA	NA	1.26E-03	1.14E-03	4.797E-03
Lead	4.8E-05	799,470	lbs/10^6 Btu	NA	NA	5.03E-03	4.57E-03	1.919E-02
Methane	2.1E-02	799,470	lbs/10^6 Btu	NA	NA	2.20E+00	2.00E+00	8.394E+00
2- Methylnaphthalene	1.6E-07	799,470	lbs/10^6 Btu	NA	NA	1.68E-05	1.52E-05	6.396E-05
Monochlorobiphenyl	1.6E-07	799,470	lbs/10^6 Btu	NA	NA	1.68E-05	1.52E-05	6.396E-05
Napthalene	2.2E-10	799,470	lbs/10^6 Btu	3.33	NA	2.30E-08	2.09E-08	8.794E-08
2-Nitrophenol	2.4E-07	799,470	lbs/10^6 Btu	NA	NA	2.51E-05	2.28E-05	9.594E-05
4-Nitrophenol	1.1E-07	799,470	lbs/10^6 Btu	NA	NA	1.15E-05	1.05E-05	4.397E-05
Octachlorodibenzo-p-dioxins	6.6E-08	799,470	lbs/10^6 Btu	NA	NA	6.91E-06	6.28E-06	2.638E-05
Octachlorodibenzo-p-furans	8.8E-11	799,470	lbs/10^6 Btu	NA	NA	9.21E-09	8.38E-09	3.518E-08
Pentachlorodibenzo-p-dioxins	1.5E-09	799,470	lbs/10^6 Btu	NA	NA	1.57E-07	1.43E-07	5.996E-07
Pentachlorodibenzo-p-furans	4.2E-10	799,470	lbs/10^6 Btu	NA	NA	4.40E-08	4.00E-08	1.679E-07
Pentachlorobiphenyl	1.2E-09	799,470	lbs/10^6 Btu	NA	NA	1.26E-07	1.14E-07	4.797E-07
Pentachlorophenol	5.1E-08	799,470	lbs/10^6 Btu	NA	NA	5.34E-06	4.85E-06	2.039E-05
Perylene	5.2E-10	799,470	lbs/10^6 Btu	NA	NA	5.44E-08	4.95E-08	2.079E-07
Phenanthrene	7.0E-06	799,470	lbs/10^6 Btu	NA	NA	7.33E-04	6.66E-04	2.798E-03
Phenols	5.1E-05	799,470	lbs/10^6 Btu	1.27E+00	NA	5.34E-03	4.85E-03	2.039E-02
Propanal	3.2E-06	799,470	lbs/10^6 Btu	NA	NA	3.35E-04	3.05E-04	1.279E-03
Propionaldehyde	6.1E-05	799,470	lbs/10^6 Btu	0.0287	NA	6.39E-03	5.81E-03	2.438E-02
Pyrene	3.7E-06	799,470	lbs/10^6 Btu	NA	NA	3.87E-04	3.52E-04	1.479E-03
Styrene	1.9E-03	799,470	lbs/10^6 Btu	6.67	NA	1.99E-01	1.81E-01	7.595E-01
2,3,7,8 Tetrachlorodibenzo-p-dioxins	8.6E-12	799,470	lbs/10^6 Btu	NA	1.50E-10	9.00E-10	8.19E-10	3.438E-09
Tetrachlorodibenzo-p-dioxins	4.7E-10	799,470	lbs/10^6 Btu	NA	NA	4.92E-08	4.47E-08	1.879E-07
2,3,7,8 Tetrachlorodibenzo-p-furans	9.9E-11	799,470	lbs/10^6 Btu	NA	NA	1.04E-08	9.42E-09	3.957E-08
Tetrachlorodibenzo-p-furans	7.5E-10	799,470	lbs/10^6 Btu	NA	NA	7.85E-08	7.14E-08	2.998E-07
Tetrachlorophenyl	2.5E-09	799,470	lbs/10^6 Btu	NA	NA	2.62E-07	2.38E-07	9.993E-07
Tetrachloroethane	3.8E-05	799,470	lbs/10^6 Btu	NA	1.10E-05	3.98E-03	3.62E-03	1.519E-02
0-Tolualdehyde	7.2E-06	799,470	lbs/10^6 Btu	NA	NA	7.54E-04	6.85E-04	2.878E-03
p-Tolualdehyde	1.1E-05	799,470	lbs/10^6 Btu	NA	NA	1.15E-03	1.05E-03	4.397E-03
Toluene	9.2E-04	799,470	lbs/10^6 Btu	25	NA	9.63E-02	8.76E-02	3.678E-01
Trichlorobiphenyl	2.6E-09	799,470	lbs/10^6 Btu	NA	NA	2.72E-07	2.47E-07	1.039E-06
1,1,1-Trichloroehane	3.1E-05	799,470	lbs/10^6 Btu	NA	NA	3.25E-03	2.95E-03	1.239E-02
Trichloroehane	3.0E-05	799,470	lbs/10^6 Btu	NA	NA	3.14E-03	2.86E-03	1.199E-02
Trichlorofluoromethane	4.1E-05	799,470	lbs/10^6 Btu	NA	NA	4.29E-03	3.90E-03	1.639E-02
2,4,6-Trichlorophenol	2.2E-08	799,470	lbs/10^6 Btu	NA	NA	2.30E-06	2.09E-06	8.794E-06
Vinyl Chloride	1.5E-05	799,470	lbs/10^6 Btu	NA	9.40E-04	1.57E-03	1.43E-03	5.996E-03
0-Xylene	2.5E-05	799,470	lbs/10^6 Btu	29	NA	2.62E-03	2.38E-03	9.993E-03
Antimony	7.9E-06	799,470	lbs/10^6 Btu	0.033	NA	8.27E-04	7.52E-04	3.158E-03
Arsenic	2.2E-05	799,470	lbs/10^6 Btu	NA	1.50E-06	2.30E-03	2.09E-03	8.794E-03
Beryllium	1.1E-06	799,470	lbs/10^6 Btu	NA	2.80E-05	1.15E-04	1.05E-04	4.397E-04
Cadmium	4.1E-06	799,470	lbs/10^6 Btu	NA	3.70E-06	4.29E-04	3.90E-04	1.639E-03
Chromium, total	2.1E-05	799,470	lbs/10^6 Btu	0.033	NA	2.20E-03	2.00E-03	8.394E-03
Cobalt	6.5E-06	799,470	lbs/10^6 Btu	0.0033	NA	6.81E-04	6.19E-04	2.598E-03
Manganese	1.6E-03	799,470	lbs/10^6 Btu	NA	NA	1.68E-01	1.52E-01	6.396E-01
Mercury	3.5E-06	799,470	lbs/10^6 Btu	0.007	NA	3.66E-04	3.33E-04	1.399E-03
Nickel	3.3E-05	799,470	lbs/10^6 Btu	NA	2.70E-05	3.45E-03	3.14E-03	1.319E-02
Selenium	2.8E-06	799,470	lbs/10^6 Btu	0.013	NA	2.93E-04	2.66E-04	1.119E-03

93

TOTAL 5.9E-02	Total Organic Compounds	6.22	5.66	23.76

FUGITIVE ROAD DUST EMISSIONS ESTIMATE

S.SCHULTZ FEBRUARY 2005, updated 5/2006 G. Hoy

(All roads are unpaved)

From Table 13.3.3-2 Industrial roads

AP 42	PM	PM10
a	0.7	0.9
b	0.45	0.45
k	4.9	1.5

E= EMISSION FACTOR #/VEHICLE MILE TRAVELED
k= PARTICLE SIZE DIMENSIONLESS NUMBER
s=SILT CONTENT WEIGHT % 8.4 %
CONTROL EFFICIENCY 80 %

E=k*(s/12)^a x (W/3)^b
For PM: **E=4.9*(.084/12)^0.7 x (W/3)^.45**
For PM10: **E=1.5*(.084/12)^0.9 x (W/3)^.45**

ID	DESCRIPTION	TRIPS PER YEAR EA	TRIPS PER DAY EA	TRIPS PER HR. EA	TRIP LENGTH FT	VEH MILES (per year)	W Veh Wt (Tons)	PM EF lb/veh mi	PM10 EF lb/veh mi	Control from wet suppression	PM EMISSIONS Tons/yr	PM 10 EMISSIONS Tons/yr	UTM "X" M	UTM "Y" M
(8-1)	LOG TRUCK TRAFFIC	6,400	25.60	2.56	1,400	**1,697**	25	**9.91**	**2.83**	0.80	1.682	0.479	548250	4978285
(8-2)	LOG LOADER TRAFFIC	51,200	204.80	12.80	600	**5,818**	25	**9.91**	**2.83**	0.80	5.767	1.644	548250	4978285
(8-6)	LUMBER TRUCKS SHIPPING	1,920	8.00	0.80	300	**109**	25	**9.91**	**2.83**	0.80	0.108	0.031	548575	4978075
(8-7)	ASH TO LAND FILL	2,100	6.00	0.25	1,000	**398**	25	**9.91**	**2.83**	0.80	0.394	0.112	548200	4978200
(8-8)	CLINKER TO LAND FILL	216	1.00	0.04	1,000	**41**	25	**9.91**	**2.83**	0.80	0.041	0.012	548200	4978200
(8-9)	EMPLOYEE TRAFFIC	23,277	93.00	93.00	150	**661**	0.9	**2.22**	**0.63**	0.80	0.147	0.042	548400	4978225
(8-10)	WOOD FUEL DELIVERY	1,234	4.94	0.49	2,100	**491**	25	**9.91**	**2.83**	0.80	0.486	0.139	548225	4978400
(8-11)	PILE FUEL RECLAIM (rem'd by blowpip	0	0.00	0.00	250	**0**	25	**9.91**	**2.83**	0.80	0.000	0.000	548275	4978087
(8-12)	TRUCK REMOVAL OF WOOD CHIPS	0	3.70	0.50	1,500	**0**	25	**9.91**	**2.83**	0.80	0.000	0.000		
								TOTALS			**8.62**	**2.46**		

COOLING TOWER EMISSION ESTIMATE

S.SCHULTZ February 2005

Bold updated with new fuel data G. Hoy 5/2006

FUEL DATA:	WOOD	MOL. WT.	REACTIONS
CARBON	50.62%	12	C + O2 -- CO2
HYDROGEN	6.51%	2	.5H2 + O2 -- H20
OXYGEN	39.61%	32	O2 -- O2
SULFUR	0.01%	32	S + O2 -- SO2
NITROGEN	0.22%	28	????
ASH	3.03%	----	----
TOTAL	100.00%		

FUEL MOISTURE CONTENT			**50%**			
FUEL HIGHER HEATING VALUE			**8500**	**BTU/#**		
FUEL ENERGY VALUE			**4250**	**BTU/LB**		
FUEL AVAILABLE	**BDT**	**11.75 G ton/hr**	**23,500**	**gr lb/hr**		
DRY FUEL			**11,750**	**dry lb/hr**		O2 dry
GRATE LOADING		155	75.81	#/HR-FT^2		O2 wet
FREE WATER			11750	LB/HR		STEAM
FUEL ENERGY			9.99E+07	BTU/HR		Net Power
						Auunal power
CARBON			495.65	LB-MOLE		
HYDROGEN			382.46	LB-MOLE		
SULFUR			0.04	LB-MOLE		
OXYGEN REQUIRED:						
	CARBON		495.65	LB-MOLE		
	HYDROGEN		191.23	LB-MOLE		
	SULFUR		0.04	LB-MOLE		
			686.92	LB-MOLE O2		
OXYGEN REQUIRED FROM AIR			541.48	LB-MOLE O2		
STD AIR REQUIRED @ 70°F 0% EXCESS			74880	LB/HR AIR		
EXCESS AIR DESIGN BASIS			135.00%	X		5.99%
FD INLET AIR			101088.5912	LB/HR		
GRATE AIR LOADING		155	652.18	#/HR-FT^2		
AIR LOADING / FUEL LOADING RATIO			8.60	# AIR/# WOOD		
TOTAL COMBUSTION PRODUCTS:			124589	LB/HR FLUE GAS		%
	CARBON DIOXIDE		21809	LB/HR		17.55%
	WATER		18634	LB/HR		15.00%
	SULFUR DIOXIDE		2	LB/HR		0.00%
	NITROGEN		77156	LB/HR		62.11%
	OXYGEN		6631	LB/HR		5.34%
	ASH		356	LB/HR		
		TOTAL	124589	LB/HR	TOTAL	100.00%
	CARBON DIOXIDE		495.65	LB-MOLE		11.03%
	WATER		1035.24	LB-MOLE		23.04%
	SULFUR DIOXIDE		0.04	LB-MOLE		0.00%
	NITROGEN		2755.59	LB-MOLE		61.32%
	OXYGEN		207.21	LB-MOLE		4.61%
		TOTAL	4493.73	LB-MOLE	TOTAL	100.00%
AVERAGE MOLECULAR WEIGHT:			27.65	LB/LB-MOLE		% BY VOL DRY
DRY MOLECULAR WEIGHT			3458.49	LB-MOLE		14.33%
AVERAGE DRY MOLECULAR WEIGHT			30.53	LB/LB-MOLE		0.00%
DSCFM			22213.28	DSCFM		79.68%
						5.99%
					TOTAL	100.00%
PLANT ELEVATION			4140.00	FT	25.9716	IN HG
FLUE GAS DENSITY WET AT 70°F			0.0620	LB/FT3		
FLUE GAS DENSITY DRY AT 70°F			0.0685	LB/FT3		

FUEL ENERGY INPUT Qf:	9.99E+07	BTU/HR		
BOILER LOSSES:				ENERGY LOSS
CARBON	1.80%			1.56E+06
WATER	1000.00	BTU/LB		1.86E+07
DRY FLUE GAS	400.00	*F		8.71E+06
WET FLUE GAS	0.50	BTU/LB		3.07E+06
SKIN HEAT LOSS	3.00E+05	BTU/HR		3.00E+05
CARBON MONOXIDE	296	PPM		1.24E+05
MISC	1.00%			9.99E+05
			TOTAL	3.34E+07
BOILER EFFICIENCY:	66.55%			
BOILER PLANT ELEVATION IS:	4140.00	FEET		
FORCED DRAFT FAN SIZING:	22415	SCFM		
FORCED DRAFT FAN @100 *F ACFM:	27329	ACFM		
FORCED DRAFT FAN STATIC PRESSURE:	12.00	IN H2O		
FORCED DRAFT FAN EFFICIENCY:	70.00%	%		
FORCED DRAFT FAN HORSE POWER:	73.71	BHP		
FD FAN INLET DUCT SIZE:	40.87	INCHES		
FD FAN OUTLET DUCT SIZE:	35.39	INCHES		
STATIC PRESSURE TEST BLOCK:	15.00%	%		
VOLUME TEST BLOCK:	10.00%	%		
FORCED DRAFT FAN SPEC.:	13.80	IN H2O @	30061.967	ACFM
PREHEAT TEMPERATURE	225	*F		
COMBUSTION AIR GAS VOLUME	33429.30	ACFM		
UNDER GRATE OPENING WIDTH	44	IN		
UNDER GRATE OPENING DEPTH	9	IN		
OPEN AREA	2.75	FT^2		
% OF COMBUSTION AIR UNDER GRATE	80.00%			
COMBUSTION AIR VELOCITY	162.08	FT/SEC		
STATIC PRESSURE DROP	3.95	IN-H2O		
INDUCED DRAFT FAN INLET TEMP.	400	*F		
INDUCED DRAFT FAN VOLUME:	54308.79	ACFM		
INDUCED DRAFT FAN STATIC PRESSURE:	18	IN H2O		
INDUCED DRAFT FAN EFFICIENCY:	65.00%	%		
INDUCED DRAFT FAN HORSE POWER:	236.62	BHP		
ID FAN INLET DUCT SIZE:	53.34	INCHES		
STATIC PRESSURE TEST BLOCK:	15.00%	%		
VOLUME TEST BLOCK:	10.00%	%		
INDUCED DRAFT FAN SPEC.:	20.7	IN H2O @	59739.673	ACFM
BOILER OPERATING CONDITIONS:				
PRESSURE:	400	PSIG		
TEMPERATURE:	750	*F TT		
ENTHALPY:	1389	BTU/LB		
CONDENSATE INPUT:	319	*F		
TOTAL STEAM PRODUCED:	60317	LB/HR		
STEAM SURFACE BLOW DOWN:	1206	LB/HR		
AIR EJECTOR STEAM:	200	LB/HR		
STEAM AVAILABLE AT TURBINE:	58911	LB/HR		
ENERGY AVAILABLE AT TURBINE:	8.18E+07	BTU/HR		
N PROCESS LOAD REQUIREMENTS LONG TERM AVERAGE:				
PRODUCTION TO BE DRIED:	0.00E+00	BD-FT		
KILN ENERGY FACTOR:	2.50	LB/BD-FT		
KILN UTILIZATION FACTOR:	90.00%	%		
AVERAGE KILN STEAM DEMAND:	0.00E+00	LB/HR		
HIGH PRESSURE HEATER CALCULATIONS:				
EXTRACTION #1 ENTHALPY:	1285.00	BTU/LB		
APPROACH TEMPERATURE:	5.00	*F		
CONDENSATE TEMPERATURE IN:	245.00	*F		
CONDENSATE TEMPERATURE OUT:	319.00	*F		
STEAM REQUIRED:	4183	LB/HR		
STEAM ENERGY INPUT:	5.38E+06	BTU/HR		
STEAM ENERGY OUT:	9.12E+05	BTU/HR		
ENERGY ADDED TO CONDENSATE	4.46E+06	BTU/HR		

INTERMEDIATE PRESSURE HEATER CALCULATIONS:	NONE	
EXTRACTION #2 ENTHALPY:	1337.00	BTU/LB
APPROACH TEMPERATURE:	5.00	*F
CONDENSATE TEMPERATURE IN:	245.00	*F
CONDENSATE TEMPERATURE OUT:	245.00	*F
STEAM REQUIRED:	0.00	LB/HR
STEAM ENERGY INPUT:	0.00E+00	BTU/HR
STEAM ENERGY OUT:	0.00E+00	BTU/HR
ENERGY ADDED TO CONDENSATE	0.00E+00	BTU/HR
PROCESS STEAM CALCULATIONS:		
AVERAGE STEAM FLOW:	0.00	LB/HR
CONDENSATE RETURN:	85.00%	%
KILN STEAM ENTHALPY (Removed):	**0.00**	**BTU/LB**
EXTRACTION STEAM ENTHALPY:	1285.00	BTU/LB
DESUPERHEAT WATER TEMP:	245.00	*F
DESUPERHEAT WATER FLOW:	0.00	LB/HR
EXTRACTION STEAM FLOW:	0.00	LB/HR
ENERGY TO KILN:	0.00E+00	BTU/HR
CONDENSATE RETURN:	0.00	LB/HR
CONDENSATE TEMP:	200.00	*F
ENERGY FROM KILN:	0.00E+00	BTU/HR
ENERGY USED IN KILNS:	0.00E+00	BTU/HR
MAKE UP CONDENSATE REQUIRED:	1206.35	LB/HR
OR:	2.41	GPM
CALCULATE DEAERATOR:		
OPERATING TEMPERATURE:	245.00	*F
EXIT CONDENSATE FLOW:	60117	LB/HR
ENERGY OUTPUT:	1.28E+07	BTU/HR
EXTRACTION+LP HEATER FLOW:	54728	LB/HR
EXTRACTION+LP ENERGY:	1.19E+07	BTU/HR
EXTRACTION ENTHALPY:	1211.00	BTU/LB
CONDENSATE TEMPERATURE:	170.00	*F
L.P. HEATER MASS FLOW:	50683	LB/HR
EXTRACTION FLOW:	4045.32	LB/HR
EXTRACTION ENERGY:	4.90E+06	BTU/HR
L.P. HEATER ENERGY:	6.99E+06	BTU/HR
CALCULATE LOW PRESSURE HEATER:		
TEMPERATURE OUT:	170.00	*F
TEMPERATURE IN:	130.00	*F
CONDENSATE MASS FLOW:	50683	LB/HR
APPROACH TEMPERATURE:	5.00	*F
EXTRACTION ENTHALPY:	1156.00	BTU/LB
EXTRACTION FLOW:	2113.97	LB/HR
EXTRACTION ENERGY:	2.44E+06	BTU/HR

CALCULATE CONDENSER:			
CONDENSER IN FLOW:		48568.55	LB/HR
ENTHALPY IN:		1060.00	BTU/LB
ENERGY INPUT:		5.18E+07	BTU/HR
TEMPERATURE OUT TURBINE		115.00	°F
ENERGY OUT:		4.21E+06	BTU/HR
ENERGY TO COOLING WATER:		4.76E+07	BTU/HR
WATER TEMPERATURE RISE:		14.65	°F
COOLING WATER MASS FLOW:		3248700	LB/HR
	OR:	6500.00	GPM
DESIGN WET BULB:		68.00	°F
C.T. APPROACH TEMP.		12.00	°F
COOLING TOWER SUMP TEMP.		80	
COND WATER OUTLET TEMP:		94.65	°F
CALCULATE ENERGY TO TURBINE:		1.76E+07	BTU/HR
CALCULATE ELECTRICAL OUTPUT:			
GENERATOR EFFICIENCY:		96.50%	%
GROSS GENERATION:		4985.29	KW-HR
CALCULATE GROSS PLANT EFFICIENCY:		17.03%	%
CALCULATE GROSS HEAT RATE:		20033.96	BTU/KW-HR
PLANT WATER RATE		11.82	LB-STEAM/KW-HR
CALCULATE BOILER FEED PUMP:			
HEAD:		1201.20	FT
FLOW:		60317	LB/HR
EFFIENCY:		70.00%	%
HORSEPOWER:		52.28	HP
CALCULATE CONDENSATE PUMP:			
HEAD:		115.50	FT
FLOW:		50683	LB/HR
EFFIENCY:		50.00%	%
HORSEPOWER:		5.91	HP
CALCULATE CIRCULATING WATER PUMPS:			
HEAD:		60.00	FT
FLOW:		3248700	LB/HR
EFFIENCY:		70.00%	%
HORSEPOWER:		140.64	HP
ESTIMATE OTHER MOTOR LOADS:			
COOLING TOWER FANS:		80.00	HP
FUEL SYSTEM:		60.00	HP
OVER FIRE AIR FAN:		100.00	HP
MISC.:		50.00	HP
TOTAL STATION SERVICE LOAD:		746.88	HP
STATION SERVICE LOAD:		605.62	KW-HR
NET POWER OUTPUT		4379.67	KW-HR
IDAHO POWER NET POWER BOUGHT		4682.48	KW-HR
POWER PURCHASED FROM IDAHO POWER		302.81	KW-HR
STATION WATER USE:			
COOLING TOWER:		50827.02	LB/HR
	OR:	101.69	GPM:
KILN:		**0.00**	**LB/HR**
	OR:	**0.00**	**GPM**
BLOW DOWN:		1206.35	LB/HR
	OR:	2.41	GPM
	TOTAL:	52033.36	LB/HR
	OR:	104.11	GPM

ANNUAL OPERATING HOURS	**8,400**	**HOUR/YR**
ANNUAL OPERATING FACTOR	100%	%
ANNUAL FUEL CONSUMPTION GREEN TONS	**98,700**	**TONS/YR**
ANNUAL FUEL CONSUMPTION DRY	**49,350**	**BDT/YR**
ANNUAL ELECTRICAL PRODUCTION	41,876,400	KWH/YR
ANNUAL NET ELECTRICAL PRODUCTION	39,332,802	KWH/YR
ANNUAL PROCESS STEAM PRODUCTION	0	1000#/YR
STACK HEIGHT	75	FT
STACK DIAMETER (INSIDE)	87	INCHES
STACK AREA	41.28	FT^2
FLUE GAS MAKE UP:		
PARTICULATE EMISSIONS RELEASED FROM STACK BASED ON PERMIT .08 G/SDCF @ 12% CO2		
PARTICULATE EMISSIONS	18.19	#/HR
ANNUAL PARTICULATE EMISSIONS **8400** HRS	76.40	TONS/YR

TAMARACK ENERGY PARTNERSHIP

COOLING TOWER EMISSION ESTIMATE

S.SCHULTZ February 2005

CIRCULATING WATER RATE	6500	GPM	
COOLING TOWER DRIFT	0.0050%	%	
DRIFT LOSS	162.435	#/HR	0.325 gpm
ENERGY INPUT	4.76E+07	Btu/hr	
WATER EVAPORATED	5.01E+04	#/HR	
EMISSIONS ESTIMATES			
PARTICULATE			
WATER CONDUCTIVITY	460	mg/l	
WATER TDS	420	mg/l	
PARTICULATE PM-10	**0.068223**	**#/HR**	**0.299 TONS/YR**
CHEMCO PRODUCT POLYMER 2307	Potasium Hydroxide		CAS 1310583
USE RATE	2 gallons/day		
USE RATE IN POUNDS PER HOUR	8.68E-01	#/HR	
CONCENTRATION IN SUMP	2.11E-05	WT %	
POTASIUM HYDROXIDE IN DRIFT LOSSES IF NOT SOLUBLE (SOLUBILITY=100%	**3.42E-03**	**#/HR**	**0.015 TONS/YR**
CHLORINE BLEACH NaOCl 15%	NaOCl	CAS 7681-52-9	
USE RATE	2.7	GAL/DAY	
USE RATE IN POUNDS PER HOUR	0.12375	#/HR	
CONCENTRATION IN SUMP	3.00608E-06	WT %	
HCL IN DRIFT LOSSES IF NOT SOLUBLE (SOLUBILITY=100%)	**7.32E-05**	**#/HR**	**0.0003 TONS/YR**

SOLID MATERIAL STORAGE AND HANDLING EMISSIONS ESTIMATE

S.SCHULTZ February 2005

SOURCES OF MATERIAL STORAGE AND HANDLING EMISSIONS

SOURCE		EMISSION FACTOR #/TON	REF.	NORMAL MAT. TONS/YR	MAX MAT. TONS/YR	OP HRS/YR	NORMAL EM #/HR	MAX EM #/HR	NORMAL EM TON/YR	MAX EM TON/YR
(TR-1)	**DEBARKER CONVEYOR DROP**	**1.93E-05**	**EPA AP-42**	32531	40664	4160	0.0002	0.0002	3.15E-04	3.93E-04
(TR-2)	**BARK BLOW LINE TO PILE & FUEL HOUSE**	**0.62**	**ORE. DEQ**	32531	40663.75	4160	4.8715	6.0894	1.01E+01	1.27E+01
	BARK LINE TO PILE	1	ORE. DEQ	8000						
	BARK LINE TO FUEL STORAGE HOUSE	0.5	ORE. DEQ	24531						
(TR-4)	**TRUCK TO PILE**	**7.03E-05**	**EPA AP-42**	29480	36850	2000	0.0010	0.0013	1.04E-03	1.30E-03
	PILE RECLAIM	7.03E-05	EPA AP-42	50000	55000	2000	0.0018	0.0019	1.76E-03	1.93E-03
	RECLAIM HOPPER LOADING	7.03E-05	EPA AP-42	50000	55000	2000	0.0018	0.0019	1.76E-03	1.93E-03
	RECLAIM CONVEYOR DROP	1.93E-05	EPA AP-42	50000	55000	2000	0.0005	0.0005	4.84E-04	5.32E-04
	SAW DUST TO PILE & FUEL HOUSE	0.679	ORE. DEQ	22406	28007.5	4160	3.6546	4.5682	7.60E+00	9.50E+00
	SAW DUST TO PILE	1	ORE. DEQ	8000						
	SAW DUST TO FUEL STORAGE HOUSE	0.5	ORE. DEQ	14406						
(ST-2)	**FUEL PILE STORAGE**	**4.86E-06**	**EPA AP-42**	50000	55000	8760	0.0000	0.0000	1.22E-04	1.34E-04
	BOTTOM ASH TO LAND FILL	1.76E-03	EPA AP-42	735	808.5	2000	0.0006	0.0007	6.46E-04	7.11E-04
(TR-5)	**FLY ASH TO LAND FILL**	**3.52E-03**	**EPA AP-42**	626	688.6	2000	0.0011	0.0012	1.10E-03	1.21E-03
	ASH PILE STORAGE	1.01E-03	EPA AP-42	1200	1320	8760	0.0001	0.0002	6.08E-04	6.69E-04
	RECLAIMER CONVEYOR DROP	1.93E-05	EPA AP-42	99012	108913.2	8520	0.0002	0.0002	9.58E-04	1.05E-03
						TOTALS	8.53	10.67	17.74	22.18

GENERAL EMISSION FACTOR EQUATIONS

LOADER AND TRUCK DROPS

E=.0018*P*k*(S/5)*(U/5)*(H/5)/((M/2)^2*(Y/6)^.33)

	WOOD	ASH	CLINKER
E= PARTICULATE EMISSIONS #/HR			
P= MATERIAL CARRIED TONS/HR	4.56	0.313	0.367
k= PART. SIZE MULTIPLIER .73 FOR PART. DIA.<30 uM	0.73	0.73	0.73
S= % SILT OR FINE PARTICULATE	10.00%	75.00%	25.00%
U= MEAN WIND SPEED MPH	4.6	4.6	4.6
H= DROP HEIGHT	4	4	4
M= MOISTURE CONTENT %	50%	15%	10%
Y= DUMPING CAPACITY YDS.	10	2.5	2.5

CONVEYOR TRANSFER AND DROP

E=.0018*P*k*(S/5)*(U/5)*(H/10)/((M/2)^2)

	WOOD
E= PARTICULATE EMISSIONS #/HR	
P= MATERIAL CARRIED TONS/HR	
k= PART. SIZE MULTIPLIER .73 FOR PART. DIA.<30 uM	0.73
S= % SILT OR FINE PARTICULATE	10.00%
U= MEAN WIND SPEED MPH	4.6
H= DROP HEIGHT	4
M= MOISTURE CONTENT %	50.00%

OPEN STORAGE PILES

E= 1.7*(S/1.5)*((365-p)/235)*(f/15)*A/24

	WOOD	ASH/CLINKER
E= PARTICULATE EMISSIONS #/HOUR		
S= % SILT OR FINE PARTICULATE	10.00%	50.00%
p= NUMBER OF DAYS PER YEAR WITH >.01 IN PRECIP.	85	85
f= % OF TIME WIND EXCEEDS 12 MPH	7.40%	7.40%
A= AREA OF PILE (ACRE)	1	0.5

(7-2) DEBARKER CONVEYOR DROP

CONVEYOR TRANSFER AND DROP

E=.0018*P*k*(S/5)*(U/5)*(H/10)/((M/2)^2)

	WOOD	
E= PARTICULATE EMISSIONS #/HR	0.00015125	
P= MATERIAL CARRIED TONS/HR	7.81995192	TON/HR
k= PART. SIZE MULTIPLIER .73 FOR PART. DIA.<30 uM	0.73	
S= % SILT OR FINE PARTICULATE	10.00%	
U= MEAN WIND SPEED MPH	4.6	
H= DROP HEIGHT	4	
M= MOISTURE CONTENT %	50.00%	
EMISSION FACTOR	1.9342E-05	#/TON

(7-6) TRUCK TO PILE

LOADER AND TRUCK DROPS

E=.0018*P*k*(S/5)*(U/5)*(H/5)/((M/2)^2*(Y/6)^.33)

	WOOD	
E= PARTICULATE EMISSIONS #/HR	0.00103674	
P= MATERIAL CARRIED TONS/HR	14.74	
k= PART. SIZE MULTIPLIER .73 FOR PART. DIA.<30 uM	0.73	
S= % SILT OR FINE PARTICULATE	10.00%	
U= MEAN WIND SPEED MPH	4.6	
H= DROP HEIGHT	4	
M= MOISTURE CONTENT %	50.00%	
Y= DUMPING CAPACITY YDS.	10	
EMISSION FACTOR	7.0335E-05	#/TON

(7-7) PILE RECLAIM

(7-8) LOADER AND TRUCK DROPS

E=.0018*P*k*(S/5)*(U/5)*(H/5)/((M/2)^2*(Y/6)^.33)

	WOOD	
E= PARTICULATE EMISSIONS #/HR	0.00175837	
P= MATERIAL CARRIED TONS/HR	25	
k= PART. SIZE MULTIPLIER .73 FOR PART. DIA.<30 uM	0.73	
S= % SILT OR FINE PARTICULATE	10.00%	
U= MEAN WIND SPEED MPH	4.6	
H= DROP HEIGHT	4	
M= MOISTURE CONTENT %	50.00%	
Y= DUMPING CAPACITY YDS.	10	
EMISSION FACTOR	7.0335E-05	#/TON

(7-9)	RECLAIM CONVEYOR DROP		
	CONVEYOR TRANSFER AND DROP		
	E=.0018*P*k*(S/5)*(U/5)*(H/10)/((M/2)*2)	WOOD	
	E= PARTICULATE EMISSIONS #/HR	0.00048355	
	P= MATERIAL CARRIED TONS/HR	25	
	k= PART. SIZE MULTIPLIER .73 FOR PART. DIA.<30 uM	0.73	
	S= % SILT OR FINE PARTICULATE	10.00%	
	U= MEAN WIND SPEED MPH	4.6	
	H= DROP HEIGHT	4	
	M= MOISTURE CONTENT %	50.00%	
	EMISSION FACTOR	1.9342E-05	#/TON
(7-17)	FUEL PILE STORAGE		
	OPEN STORAGE PILES		
	E= 1.7*(S/1.5)*((365-p)/235)*(f/15)*A/24	WOOD	
	E= PARTICULATE EMISSIONS #/HOUR	2.7757E-05	
	S= % SILT OR FINE PARTICULATE	10.00%	
	p= NUMBER OF DAYS PER YEAR WITH >.01 IN PRECIP.	85	
	f= % OF TIME WIND EXCEEDS 12 MPH	7.40%	
	A= AREA OF PILE (ACRE)	1	
	EMISSION FACTOR IN #/TON	4.8631E-06	#/TON
(7-18)	BOTTOM ASH TO LAND FILL		
	LOADER AND TRUCK DROPS		
	E=.0018*P*k*(S/5)*(U/5)*(H/5)/((M/2)*2*(Y/6)*.33)	CLINKER	
	E= PARTICULATE EMISSIONS #/HR	0.0006462	
	P= MATERIAL CARRIED TONS/HR	0.3675	
	k= PART. SIZE MULTIPLIER .73 FOR PART. DIA.<30 uM	0.73	
	S= % SILT OR FINE PARTICULATE	25.00%	
	U= MEAN WIND SPEED MPH	4.6	
	H= DROP HEIGHT	4	
	M= MOISTURE CONTENT %	10.00%	
	Y= DUMPING CAPACITY YDS.	5	
	EMISSION FACTOR	0.00175837	#/TON
(7-19)	FLY ASH TO LAND FILL		
	LOADER AND TRUCK DROPS		
	E=.0018*P*k*(S/5)*(U/5)*(H/5)/((M/2)*2*(Y/6)*.33)	ASH	
	E= PARTICULATE EMISSIONS #/HR	0.00110074	
	P= MATERIAL CARRIED TONS/HR	0.313	
	k= PART. SIZE MULTIPLIER .73 FOR PART. DIA.<30 uM	0.73	
	S= % SILT OR FINE PARTICULATE	75.00%	
	U= MEAN WIND SPEED MPH	4.6	
	H= DROP HEIGHT	4	
	M= MOISTURE CONTENT %	15.00%	
	Y= DUMPING CAPACITY YDS.	5	
TR-10	**EMISSION FACTOR**	**0.00352**	**#/TON**
(7-20)	ASH PILE STORAGE		
	OPEN STORAGE PILES		
	E= 1.7*(S/1.5)*((365-p)/235)*(f/15)*A/24	CLINKER/ASH	
	E= PARTICULATE EMISSIONS #/HOUR	0.00013879	
	S= % SILT OR FINE PARTICULATE	50.00%	
	p= NUMBER OF DAYS PER YEAR WITH >.01 IN PRECIP.	85	
	f= % OF TIME WIND EXCEEDS 12 MPH	7.40%	
	A= AREA OF PILE (ACRE)	1	
	EMISSION FACTOR IN #/TON	0.00101314	
(7-21)	RECLAIMER CONVEYOR DROP		
	CONVEYOR TRANSFER AND DROP		
	E=.0018*P*k*(S/5)*(U/5)*(H/10)/((M/2)*2)	WOOD	
	E= PARTICULATE EMISSIONS #/HR	0.00022478	
	P= MATERIAL CARRIED TONS/HR	11.6211268	
	k= PART. SIZE MULTIPLIER .73 FOR PART. DIA.<30 uM	0.73	
	S= % SILT OR FINE PARTICULATE SAWDUST	10.00%	
	U= MEAN WIND SPEED MPH	4.6	
	H= DROP HEIGHT	4	
	M= MOISTURE CONTENT %	50.00%	
	EMISSION FACTOR	1.9342E-05	#/TON
(7-22)	CHIPS TO LOAD OUT BIN		
(7-23)	OREGON DEQ FACTOR	1	#/TON
	TONS PER YEAR	22000	TONS/YR
	CONTROL BY ENCLOSURE (CHIP BIN)	**50%**	
	EMISSION FACTOR	**0.5**	**#/TON**

FUEL STORAGE AND HANDLING EMISSIONS

DIESEL FUEL		28,000	gal
TANK SIZE	2	10,000	gal
TANK DIAMETER		8.0	ft
TANK LENGTH		28.0	ft
TANK SIZE	1	8,000	gal
TANK DIAMETER		8.0	ft
TANK LENGTH		22.0	ft
LOCATION	ABOVE GROUND		
VENT SIZE		2.0	in (est.)
ANNUAL THROUGHPUT		**118,000**	**gal**
	(2005 actual was 117,476 gal)		

GASOLINE FUEL		10,000	gal
TANK SIZE	1	10,000	gal
TANK DIAMETER		8.0	ft
TANK LENGTH		28.0	ft
LOCATION	ABOVE GROUND		
VENT SIZE		2.0	in (est.)
ANNUAL THROUGHPUT		**120,000**	**gal**

LOSSES FROM TANKS ARE BREATHING, WORKING AND DISPLACEMENT LOSSES AND SPILLAGE
BREATHING AND WORKING LOSSES ARE ESTIMATED FROM EPA AP-42 SECTION 4.3
DISPLACEMENT AND SPILLAGE LOSSES FOR GASOLINE ARE ESTIMATED FROM EPA AP-42 TABLE 4.4-4

BREATHING LOSSES

Lb= 2.21*10^-4*M*(P/(14.7-P))^.68*D^1.73*H^.51*DT^.5*Fp*C*Kc

Lb= BREATHING LOSSES	**DIESEL**	**GASOLINE**	
M= MOLECULAR WEIGHT OF VAPOR IN STORAGE TANK	130	62	#/# mol
P= TRUE VAPOR PRESSURE AT BULK LIQUID CONDITIONS	0.0074	6.9	PSIA
D= TANK DIAMETER	8	8	ft
H= VAPOR SPACE HEIGHT	4	4	ft
DT= AVERAGE AMBIENT TEMPERATURE CHANGE D TO N	40	40	degrees F
Fp= PAINT FACTOR	1.33	1.33	
C= ADJUSTMENT FACTOR FOR SMALL DIAMETER TANKS	0.4	0.4	
Kc= CRUDE OIL FACTOR	1	1	

DIESEL BREATHING LOSSES PER TANK	**0.0409**	**lb/day**
GASOLINE BREATHING LOSSES	**1.5708**	**lb/day**

WORKING LOSSES

Lw= 2.4*10^-2*M*P*Kn*Kc

Lw= WORKING LOSSES LB/1000 GAL THROUGH PUT	**DIESEL**	**GASOLINE**	
M= MOLECULAR WEIGHT OF VAPOR IN STORAGE TANK	130	62	#/# mol
P= TRUE VAPOR PRESSURE AT BULK LIQUID CONDITIONS	0.0074	6.9	PSIA
Kn= TURNOVER FACTOR	1.0	1.0	
Kc= CRUDE OIL FACTOR	1.0	1.0	

DIESEL WORKING LOSSES		**0.023**	**#/1000 gal**		
GASOLINE WORKING LOSSES		**10.267**	**#/1000 gal**		
GASOLINE DISPLACEMENT LOSS FACTOR		**9**	**#/1000 gal**		
SPILLAGE LOSS FACTOR		**0.7**	**#/1000 gal**		
TOTAL DIESEL LOSSES		**98**	lb/yr	**0.011**	b/hr
TOTAL GASOLINE LOSSES		**2969**	lb/yr	**0.339**	b/hr
DIESEL EMISSIONS AS VOC		**0.0111**	**lb/hr**	**0.049**	**t/yr**
GASOLINE EMISSIONS AS VOC	79.99%	**0.2711**	**lb/hr**	**1.188**	**t/yr**

HAZARDOUS EMISSIONS FROM GASOLINE

COMPOUND	CAS	WT FRACTION	EMISSIONS		EMISSIONS	
BENZENE	71432	0.014	**4.75E-03**	**lb/hr**	**2.08E-02**	**t/yr**
LEAD	78002	0.0000528	**1.79E-05**	**lb/hr**	**7.84E-05**	**t/yr**
XYLENES	1E+06	0.077	**2.61E-02**	**lb/hr**	**1.14E-01**	**t/yr**
ETHYL BENZENE	1E+05	0.014	**4.75E-03**	**lb/hr**	**2.08E-02**	**t/yr**
TOLUENE	1E+05	0.065	**2.20E-02**	**lb/hr**	**9.65E-02**	**t/yr**
HEXANE	1E+05	0.03	**1.02E-02**	**lb/hr**	**4.45E-02**	**t/yr**

SECTION 5

TAMARACK ENERGY PARTNERSHIP

DRAWER H • NEW MEADOWS • IDAHO 83654
PHONE (208) 347-2111

June 12, 2006

Jeff Kenknight
Manager of Federal and Delegated Air Program Units
EPA Region X Office of Air, Waste, and Toxics
1200 Sixth Avenue
Mail Stop AWT-107
Seattle, Washington 98101

Dear Mr. Kenknight,

We are in the process of submitting a renewal/update for our Tier 1 permit. Our current permit does not directly require fuel monitoring, and we wish to use boiler steaming rate (solely) in our new permit to show compliance with 40CFR 60.49b(d).

This regulation requires fuel usage monitoring for industrial boilers with a capacity of over 100MMbtu/hr. Our boiler will be permitted for a maximum of 799, 470 BTU/year (with a fuel value of 8100 BTU/done dry pound).

This is a practical solution. The only fuel the boiler will burn is wood-by-products. (The annual capacity factor for wood will be equal to1.) And additionally, our boiler already has a steaming rate monitor.

Validation studies have been preformed by other sites to document the methods' accuracy – for tax purposes. And finally, a precedent has been set by another nearby sawmill which received permission to use these monitors to document their fuel usage.

We are sending in this request now, in order to proactively assist the IDEQ permit writers as their prepare the new permit(s).

Sincerely, Gerry Kincaid

Gerry Kincaid
CoGen Superintendent

Cc: Robert Baldwin (IDEQ – Boise)
Gretchen Hoy (HOY Environmental - Spokane)
Bill Rogers (IDEQ - Boise)

SECTION 6

Post-it® Fax Note 7671

Date 4/24/06	# of pages ▶ 4
To Nov Environmental	From Bob Baldwin
Co./Dept. Gretchen	Co. DEQ
Phone # 509 982-6181	Phone # 208-373-0454
Fax # 509-532-9595	Fax # 208-373-0143

FILE COPY

TAMARACK ENGINEERING TEST REPORT

BURNING RAILROAD TIES

December 1, 1993

Prepared by:

YANKE ENERGY

P.O. Box 5405
4414 S. Gekeler Lane
Boise, Idaho 83705
(208) 338-2200

Duane Roskens

TAMARACK ENGINEERING TEST

SUMMARY 12-1-93

	WOOD	50/50	100% TIE	LIMIT	
PARTICULATE	0.0338	0.0288	0.0349	0.08	G/DSCF AT 8% O2
CO PPM	432.0	266.0	275.0		
CO LB/HR	57.6	31.3	33.2		
NOX PPM	125.0	186.0	191.0		
NOX LB/HR	27.4	35.9	37.9		
S02 PPM	0.6	2.6	6.9		
SO2 LB/HR	0.2	0.7	1.9		

SOURCE EMISSION EVALUATION REPORT

Post-it® Fax Note 7671	Date 5/8/06	# of pages ▸ 2
To Gretchen Hoy	From R. Baldwin	
Co./Dept. Hoy Environmental	Co. DEQ	
Phone #	Phone # 208-373-0454	
Fax # 5095329595	Fax #	

MASS PARTICULATE EMISSION RATE AND OPACITY OBSERVATIONS

Yanke Energy CG-1 Boiler

Tamarack Mills, LLC.

Tamarack, Idaho

Prepared for: Chuck Lively
Plant Superintendent, Cogeneration
Tamarack Mills, LLC.
Drawer H
New Meadows, Idaho 83654
(208) 347-2111
FAX (208) 347 2273

Prepared by: Spidell and Associates, Ltd. Co.
2403 Spaulding
Boise, Idaho 83705
(208) 336-4862

June 17, 2002

INTRODUCTION

A performance test for particulate matter emissions was conducted on the Yanke Energy CG-1 Boiler located at Tamarack Mills, L.L.C. in Tamarack, Idaho. The tests were performed to comply with provisions 1.4, Monthly Facility Wide Fugitive Inspection, 2.4 Particulate Matter Compliance Test and 2.5, Annual Method 9 Opacity Observation of Boiler Emissions.

Three particulate emissions tests were performed using EPA Methods 1 through 5 and as outlined in 40 CFR Appendix A Methods 1 through 5. Concurrent visible emissions observations were performed following EPA Method 9.

The testing was conducted on May 23, 2002. No Regulatory Personal were present to witness the tests. A Protocol was submitted to and approved by the Boise IDEQ Regional Office.

SUMMARY

The Method 5 mass particulate emission rate from the Scrubber exhaust averaged 8.67 pounds per hour, 0.0414 gr/dscf corrected to eight percent Oxygen. An EPA Method 202 Analysis was also performed. Results of the combined Method 5 and 202 averaged 10.09 pounds per hour, 0.0492 gr/dscf at eight percent Oxygen. Results of the tests are summarized in Table 1. Computer printouts for each of the tests are included in Appendix A. Field Data and Laboratory Data sheets used to prepare the computer printouts are included as Appendix B.

The IDEQ Summary Format for Particulate tests is included as Figure 1. The Method 5 and 202 sample train is depicted in Figure 2.

During each test period an Enterac Wet Cell CO and NOX monitor was used to determine the ppm by volume dry for CO and NOX to use to determine the mass CO and NOX emission rate. The CO emission rate averaged 29.9 pounds per hour. The NOX emission rate averaged 19.29 pounds per hour.

The boiler produced and average of 67,120 pounds per hour of steam at 390 psi during the 3 one hour Particulate Tests. Operating Parameters are summarized in Table 2. The boiler operating parameter summary along with the test logs are included in Appendix C.

The Facility Wide Fugitive Inspection was made on May 23, 2002. No fugitive emissions were observed from the enclosed Mill, Cogeneration Unit or log yard. The facility dry kilns were not operating. A Site Plan is included as Figure 3.

Opacity observation readings of the boiler exhaust did not exceed an average Method 9 reading of 5% during the three hours of observation.

SECTION 7

ANALYTICAL LABS, INC.
1804 N 33RD ST
BOISE, ID 83703

Heat of Combustion Results

Date of Analysis: 5/10/2006
Analyst: Jennifer K. Lantz

Sample: **#13016**

Lab #: 06X1374-01

Gross Heat of Combustion:		4500	calories/gram
	or	8100	Btu/lb

Lab Supervisor: Kathleen A. Keller
Report Date: 5/12/2006

SECTION 8

Idaho DEQ Emission Factor Guide for Wood Industry

ATTACHMENT B

01/0[illegible]7
vab

Process Equipment	Description	Units	Pounds Pollutant Per Unit Thruput PM	PM-10	SOx	NOx	CO	VOC	PM/PM-10 Adj. Factor	For Condition	Reference
Log Debarking	Uncontrolled Emis.	Tons of logs	0.024	0.011	–	–	–	–	–	–	1,2
Sawing Logs	Uncontrolled Emis.	Tons of Logs	0.35	0.2	–	–	–	–	0.4-1.0**	55-25% H20 in log	1,2
Sawdust Pile	Uncontrolled Emis.	Tons Handled	1.0	0.36	–	–	–	–	0.4-1.0	50-25% H20 in pile	1,2
Lumber Drying Kilns	Uncontrolled Emis.	M Board Feet	0.33	0.19	–	–	–	1.50	–	–	1,4
Cyclone Exhaust	Dry & Green Chips,	Bonedry Tons	0.5	0.25 (both for Medium Efficiency)*				–	–	–	3
	Shavings, Hogged	Bonedry Tons	0.2	0.16 (both for High Efficiency)*				–	–	–	3
	Fuel/Bark, Green	Bonedry Tons	0.001	0.001(with Baghouse)				–	–	–	3
	Sawdust.										
	Mill Mix	(grains/scf Air)	0.03	0.015 (both for Medium Efficiency)*				–	0.4-1.0***	50-25% H20 in Mix	2
	Mill Mix	(grains/scf Air)	0.015	0.011 (both for High Efficiency)*				–	0.4-1.0***	50-25% H20 in Mix	2
	Mill Mix	(grains/scf Air)	0.0001	0.0001 (with Baghouse)				–	0.4-1.0***	50-25% H20 in Mix	2
Cyclone Exhaust	Sanderdust	Bonedry Tons	2.0	1.6 (both-- for High Efficiency)*				–	–	–	3
	Sanderdust	Bonedry Tons	0.04	0.04 (with Baghouse)			–	–	–	–	3
	Sanderdust	(grains/scf Air)	0.055	0.028 (both for Medium Efficiency)*				–	0.65-1.0***	50-25% H20 in Mix	2
	Sanderdust	(grains/scf Air)	0.025	0.02 (both for High Efficiency)*				–	0.65-1.0***	50-25% H20 in Mix	
	Sanderdust	(grains/scf Air)	0.0001	0.0001 (with Baghouse)				–	0.65-1.0***	50-25% H20 in Mix	
Target Box	Medium Efficiency	Bonedry Tons	0.1	0.05	–	–	–	–	–	–	3
Waste Wood	Bin Venting	Tons Handled	1.0	0.58	–	–	–	–	0.4-1.0	50-25% H2O content	1,2
	Bin Unloading	Tons Handled	2.0	1.2	–	–	–	–	0.4-1.0	50-25% H2O content	1,2

1. EPA 450/4-90-003, March 1990, "AIRs Facility Subsystem Source Classification C es and Emission Factor Listing for Criteria Pollutants."
2. AP-42, dated February 1980.
3. Oregon DEQ/AQ Permitting and Inspection Manual, November 1993.
4. Gullian, R. and Washington, E., ET Report 1/20 and 1/25/92 by Environmental Measurement, Flagstaff, AZ, 1992.
5. AP-42, dated January 1995.

* Efficiency range determined per C. E. Lapple equations (Air Pollution Control by C. Cooper and F. C. Alley; Chapter 4).
** Consider also whether operation is inside and how well enclosed.
***Mill Mix is less dry and more coarse than Sander Dust.

Memorandum from TSB

ID - Pay on kilns, cyclones, boilers

New

Process Equipment	Description	Throughput Units	Pounds of Pollutant per Throughput Unit[1]				
			PM[2]	SO_2	NO_x	CO	VOC
Wood-Fired Boilers	Dutch Oven	1000 lb steam	0.4[3]	0.014	0.31[4]	3.0[4]	0.13
	Spreader-Stoker	1000 lb steam	0.4[3]	0.014	0.31[4]	2.0[4,5]	0.13
	Fuel Cell	1000 lb steam	0.4[3]	0.014	0.31[4]	1.0[4,6]	0.13
Veneer Dryer – Gas Heat	Doug Fir (uncontrolled)	1000 ft^2 (3/8" basis)	0.52	NA[7]	0.12	0.02	0.22
	Doug Fir (Burley or 45% control)	1000 ft^2 (3/8" basis)	0.29	NA	0.12	0.02	0.22
	Hemlock, White Fir (uncontrolled)	1000 ft^2 (3/8" basis)	0.15	NA	0.12	0.02	0.22
	Hemlock, White Fir (Burley or 45% control)	1000 ft^2 (3/8" basis)	0.10	NA	0.12	0.02	0.22
Veneer Dryer – Steam Heat	Doug Fir (uncontrolled)	1000 ft^2 (3/8" basis)	1.01	NA	NA	NA	0.04
	Doug Fir (Burley or 45% control)	1000 ft^2 (3/8" basis)	0.56	NA	NA	NA	0.04
	Hemlock, White Fir (uncontrolled)	1000 ft^2 (3/8" basis)	0.25	NA	NA	NA	0.04
	Hemlock, White Fir (Burley or 45% control)	1000 ft^2 (3/8" basis)	0.15	NA	NA	NA	0.04
Veneer Dryer – Wood Fired	All species (<20% moisture in fuel)	1000 ft^2 (3/8" basis)	0.75[8]	NA	0.4	1.4	0.2
	All species (≥20% moisture in fuel)	1000 ft^2 (3/8" basis)	1.50	NA	0.4	1.4	0.2
Cyclone- Dry and Green chips, Shavings, Hogged Fuel/Bark, Green Sawdust	Medium Efficiency	Bone dry tons	0.5	NA	NA	NA	NA
	High Efficiency	Bone dry tons	0.2	NA	NA	NA	NA
	Baghouse control	Bone dry tons	0.001	NA	NA	NA	NA
Cyclone - Sanderdust	High Efficiency	Bone dry tons	2.0	NA	NA	NA	NA
	Baghouse control	Bone dry tons	0.04	NA	NA	NA	NA
Target Box		Bone dry tons	0.1	NA	NA	NA	NA
Lumber Dry Kilns	Douglas Fir	1000 board feet	0.02[9]	NA	NA	NA	0.5[10]
	Hemlock	1000 board feet	0.05[9]	NA	NA	NA	0.25[9]
	Ponderosa Pine	1000 board feet	ND[11]	NA	NA	NA	1.4[10]
Press Vents - uncontrolled	Particleboard	1000 ft^2 (3/4" basis)	SS[12]	NA	NA	NA	SS
	Hardboard	1000 ft^2 (1/8" basis)	SS	NA	NA	NA	SS

[1] The emissions factors listed in this table should only be used when better information (i.e., source test data) is not available.
[2] The PM_{10} fraction is dependent upon the type of control equipment. See AQ-EF03 for estimated PM_{10} fractions.
[3] The PM factors are equivalent to 0.1 gr/dscf at 65% boiler efficiency. For other allowable emissions concentrations, the emission factor may be ratioed (e.g., 0.2/0.1 gr/dscf x 0.40 = 0.80 lb/10^3 steam).
[4] These factors are based on collective source tests as of 1992.
[5] Spreader-Stokers with small combustion chambers may exhibit higher CO levels.
[6] Recent tests have shown CO levels in the range of 0.1 to 0.5.
[7] There is no applicable emission factor because the pollutant is either not emitted or emitted at negligible levels.
[8] Based on statewide rule limit.
[9] Based on OSU study (Willamette Industries)
[10] Based on University of Idaho study (NCASI) and reported as pounds of carbon per 1000 board feet.
[11] No data available, but expected to be less than Douglas Fir factor.
[12] Use source specific data because most plants have performed source testing.

Type of Control	PM_{10} Fraction[1] of Total Particulate Matter (PM)[2]				
	Boilers	Veneer Dryers	Particle Dryers	Press Vents	Cyclones and Process Equipment
Uncontrolled	50	100	75	85	
Bag filter system					100
Cyclone – high efficiency					80
Cyclone – medium efficiency					50
Scrubber – Ceilcote	100	100	100		
Wet scrubber – medium to high efficiency	95	100	95		
Wet scrubber – low pressure	80	100	80		
ESP – both wet and dry	100	100	100		
EFB	100	100	100		
Multiclone – high pressure	95		95		
Multiclone – low pressure	50		75		

[1] PM_{10} fraction as a percent of total particulate matter for different types of control equipment.
[2] These PM_{10} fractions should be used for guidance only when better information is not available.

13.2.2 Unpaved Roads

13.2.2.1 General

When a vehicle travels an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed.

The particulate emission factors presented in the previous draft version of this section of AP-42, dated October 2001, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material[25]. EPA included these sources in the emission factor equation for unpaved public roads (equation 1b in this section) since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the unpaved public road emission factor equation only estimates particulate emissions from resuspended road surface material [23, 26]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOBILE6.2 [24]. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOBILE6.2 to estimate particulate emissions from vehicle traffic on unpaved public roads. It also incorporates the decrease in exhaust emissions that has occurred since the unpaved public road emission factor equation was developed. The previous version of the unpaved public road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

13.2.2.2 Emissions Calculation And Correction Parameters[1-6]

The quantity of dust emissions from a given segment of unpaved road varies linearly with the volume of traffic. Field investigations also have shown that emissions depend on source parameters that characterize the condition of a particular road and the associated vehicle traffic. Characterization of these source parameters allow for "correction" of emission estimates to specific road and traffic conditions present on public and industrial roadways.

Dust emissions from unpaved roads have been found to vary directly with the fraction of silt (particles smaller than 75 micrometers [μm] in diameter) in the road surface materials.[1] The silt fraction is determined by measuring the proportion of loose dry surface dust that passes a 200-mesh screen, using the ASTM-C-136 method. A summary of this method is contained in Appendix C of AP-42. Table 13.2.2-1 summarizes measured silt values for industrial unpaved roads. Table 13.2.2-2 summarizes measured silt values for public unpaved roads. It should be noted that the ranges of silt content vary over two orders of magnitude. Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data.

Since the silt content of a rural dirt road will vary with geographic location, it should be measured for use in projecting emissions. As a conservative approximation, the silt content of the parent soil in the area can be used. Tests, however, show that road silt content is normally lower than in the surrounding parent soil, because the fines are continually removed by the vehicle traffic, leaving a higher percentage of coarse particles.

Other variables are important in addition to the silt content of the road surface material. For example, at industrial sites, where haul trucks and other heavy equipment are common, emissions are highly correlated with vehicle weight. On the other hand, there is far less variability in the weights of cars and pickup trucks that commonly travel publicly accessible unpaved roads throughout the United States. For those roads, the moisture content of the road surface material may be more dominant in determining differences in emission levels between, for example a hot, desert environment and a cool, moist location.

The PM-10 and TSP emission factors presented below are the outcomes from stepwise linear regressions of field emission test results of vehicles traveling over unpaved surfaces. Due to a limited amount of information available for PM-2.5, the expression for that particle size range has been scaled against the result for PM-10. Consequently, the quality rating for the PM-2.5 factor is lower than that for the PM-10 expression.

Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE MATERIAL ON INDUSTRIAL UNPAVED ROADS[a]

Industry	Road Use Or Surface Material	Plant Sites	No. Of Samples	Silt Content (%)	
				Range	Mean
Copper smelting	Plant road	1	3	16 - 19	17
Iron and steel production	Plant road	19	135	0.2 - 19	6.0
Sand and gravel processing	Plant road	1	3	4.1 - 6.0	4.8
	Material storage area	1	1	-	7.1
Stone quarrying and processing	Plant road	2	10	2.4 - 16	10
	Haul road to/from pit	4	20	5.0-15	8.3
Taconite mining and processing	Service road	1	8	2.4 - 7.1	4.3
	Haul road to/from pit	1	12	3.9 - 9.7	5.8
Western surface coal mining	Haul road to/from pit	3	21	2.8 - 18	8.4
	Plant road	2	2	4.9 - 5.3	5.1
	Scraper route	3	10	7.2 - 25	17
	Haul road (freshly graded)	2	5	18 - 29	24
Construction sites	Scraper routes	7	20	0.56-23	8.5
Lumber sawmills	Log yards	2	2	4.8-12	8.4
Municipal solid waste landfills	Disposal routes	4	20	2.2 - 21	6.4

[a]References 1,5-15.

The following empirical expressions may be used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road, per vehicle mile traveled (VMT):

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation:

$$E = k\ (s/12)^{a}(W/3)^{b} \tag{1a}$$

and, for vehicles traveling on publicly accessible roads, dominated by light duty vehicles, emissions may be estimated from the following:

$$E = \frac{k\ (s/12)^{a}(S/30)^{d}}{(M/0.5)^{c}} - C \tag{1b}$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

The source characteristics s, W and M are referred to as correction parameters for adjusting the emission estimates to local conditions. The metric conversion from lb/VMT to grams (g) per vehicle kilometer traveled (VKT) is as follows:

1 lb/VMT = 281.9 g/VKT

The constants for Equations 1a and 1b based on the stated aerodynamic particle sizes are shown in Tables 13.2.2-2 and 13.2.2-4. The PM-2.5 particle size multipliers (k-factors) are taken from Reference 27.

Table 13.2.2-2. CONSTANTS FOR EQUATIONS 1a AND 1b

Constant	Industrial Roads (Equation 1a)			Public Roads (Equation 1b)		
	PM-2.5	PM-10	PM-30*	PM-2.5	PM-10	PM-30*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6.0
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.3
d	-	-	-	0.5	0.5	0.3
Quality Rating	B	B	B	B	B	B

*Assumed equivalent to total suspended particulate matter (TSP)
"-" = not used in the emission factor equation

Table 13.2.2-2 also contains the quality ratings for the various size-specific versions of Equation 1a and 1b. The equation retains the assigned quality rating, if applied within the ranges of source conditions, shown in Table 13.2.2-3, that were tested in developing the equation:

Table 13.2.2-3. RANGE OF SOURCE CONDITIONS USED IN DEVELOPING EQUATION 1a AND 1b

Emission Factor	Surface Silt Content, %	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content, %
		Mg	ton	km/hr	mph		
Industrial Roads (Equation 1a)	1.8-25.2	1.8-260	2-290	8-69	5-43	4-17[a]	0.03-13
Public Roads (Equation 1b)	1.8-35	1.4-2.7	1.5-3	16-88	10-55	4-4.8	0.03-13

[a] See discussion in text.

As noted earlier, the models presented as Equations 1a and 1b were developed from tests of traffic on unpaved surfaces. Unpaved roads have a hard, generally nonporous surface that usually dries quickly after a rainfall or watering, because of traffic-enhanced natural evaporation. (Factors influencing how fast a road dries are discussed in Section 13.2.2.3, below.) The quality ratings given above pertain to the mid-range of the measured source conditions for the equation. A higher mean vehicle weight and a higher than normal traffic rate may be justified when performing a worst-case analysis of emissions from unpaved roads.

The emission factors for the exhaust, brake wear and tire wear of a 1980's vehicle fleet (*C*) was obtained from EPA's MOBILE6.2 model [23]. The emission factor also varies with aerodynamic size range

Petroleum resin products historically have been the dust suppressants (besides water) most widely used on industrial unpaved roads. Figure 13.2.2-5 presents a method to estimate average control efficiencies associated with petroleum resins applied to unpaved roads.[20] Several items should be noted:

1. The term "ground inventory" represents the total volume (per unit area) of petroleum resin concentrate (*not solution*) applied since the start of the dust control season.

2. Because petroleum resin products must be periodically reapplied to unpaved roads, the use of a time-averaged control efficiency value is appropriate. Figure 13.2.2-5 presents control efficiency values averaged over two common application intervals, 2 weeks and 1 month. Other application intervals will require interpolation.

3. Note that zero efficiency is assigned until the ground inventory reaches 0.05 gallon per square yard (gal/yd^2). Requiring a minimum ground inventory ensures that one must apply a reasonable amount of chemical dust suppressant to a road before claiming credit for emission control. Recall that the ground inventory refers to the amount of petroleum resin concentrate rather than the total solution.

As an example of the application of Figure 13.2.2-5, suppose that Equation 1a was used to estimate an emission factor of 7.1 lb/VMT for PM-10 from a particular road. Also, suppose that, starting on May 1, the road is treated with 0.221 gal/yd^2 of a solution (1 part petroleum resin to 5 parts water) on the first of each month through September. Then, the average controlled emission factors, shown in Table 13.2.2-5, are found.

Table 13.2-2-5. EXAMPLE OF AVERAGE CONTROLLED EMISSION FACTORS FOR SPECIFIC CONDITIONS

Period	Ground Inventory, gal/yd^2	Average Control Efficiency, %[a]	Average Controlled Emission Factor, lb/VMT
May	0.037	0	7.1
June	0.073	62	2.7
July	0.11	68	2.3
August	0.15	74	1.8
September	0.18	80	1.4

[a] From Figure 13.2.2-5, ≤ 10 µm. Zero efficiency assigned if ground inventory is less than 0.05 gal/yd^2. 1 lb/VMT = 281.9 g/VKT. 1 gal/yd^2 = 4.531 L/m^2.

Besides petroleum resins, other newer dust suppressants have also been successful in controlling emissions from unpaved roads. Specific test results for those chemicals, as well as for petroleum resins and watering, are provided in References 18 through 21.

1.6 Wood Residue Combustion In Boilers

1.6.1 General[1-6]

The burning of wood residue in boilers is mostly confined to those industries where it is available as a byproduct. It is burned both to obtain heat energy and to alleviate possible solid residue disposal problems. In boilers, wood residue is normally burned in the form of hogged wood, bark, sawdust, shavings, chips, mill rejects, sanderdust, or wood trim. Heating values for this residue range from about 4,500 British thermal units/pound (Btu/lb) of fuel on a wet, as-fired basis, to about 8,000 Btu/lb for dry wood. The moisture content of as-fired wood is typically near 50 weight percent for the pulp, paper and lumber industries and is typically 10 to 15 percent for the furniture industry. However, moisture contents may vary from 5 to 75 weight percent depending on the residue type and storage operations. Generally, bark is the major type of residue burned in pulp mills; either a mixture of wood and bark residue or wood residue alone is burned most frequently in the lumber, furniture, and plywood industries.

1.6.2 Firing Practices[5, 7, 8]

Various boiler firing configurations are used for burning wood residue. One common type of boiler used in smaller operations is the Dutch oven. This unit is widely used because it can burn fuels with very high moisture content. Fuel is fed into the oven through an opening in the top of a refractory-lined furnace. The fuel accumulates in a cone-shaped pile on a flat or sloping grate. Combustion is accomplished in two stages: (1) drying and gasification, and (2) combustion of gaseous products. The first stage takes place in the primary furnace, which is separated from the secondary furnace chamber by a bridge wall. Combustion is completed in the secondary chamber before gases enter the boiler section. The large mass of refractory helps to stabilize combustion rates but also causes a slow response to fluctuating steam demand.

In another boiler type, the fuel cell oven, fuel is dropped onto suspended fixed grates and is fired in a pile. Unlike the Dutch oven, the refractory-lined fuel cell also uses combustion air preheating and positioning of secondary and tertiary air injection ports to improve boiler efficiency. Because of their overall design and operating similarities, however, fuel cell and Dutch oven boilers have many comparable emission characteristics.

The firing method most commonly employed for wood-fired boilers with a steam generation rate larger than 100,000 lb/hr is the spreader stoker. In this boiler type, wood enters the furnace through a fuel chute and is spread either pneumatically or mechanically across the furnace, where small pieces of the fuel burn while in suspension. Simultaneously, larger pieces of fuel are spread in a thin, even bed on a stationary or moving grate. The burning is accomplished in three stages in a single chamber: (1) moisture evaporation; (2) distillation and burning of volatile matter; and (3) burning of fixed carbon. This type of boiler has a fast response to load changes, has improved combustion control, and can be operated with multiple fuels. Natural gas, oil, and/or coal, are often fired in spreader stoker boilers as auxiliary fuels. The fossil fuels are fired to maintain constant steam production when the wood residue moisture content or mass rate fluctuates and/or to provide more steam than can be generated from the residue supply alone. Although spreader stokers are the most common stokers among larger wood-fired boilers, overfeed and underfeed stokers are also utilized for smaller units.

Another boiler type sometimes used for wood combustion is the suspension-fired boiler. This boiler differs from a spreader stoker in that small-sized fuel (normally less than 2 mm and normally low moisture) is blown into the boiler and combusted by supporting it in air rather than on fixed grates. Rapid changes in combustion rate and, therefore, steam generation rate are possible because the finely divided fuel particles burn very quickly.

A later innovation in wood firing is the fluidized bed combustion (FBC) boiler. A fluidized bed consists of inert particles through which air is blown so that the bed behaves as a fluid. Wood residue enters in the space above the bed and burns both in suspension and in the bed. Because of the large thermal mass represented by the hot inert bed particles, fluidized beds can handle fuels with moisture contents up to near 70 percent (total basis). Fluidized beds can also handle dirty fuels (up to 30 percent inert material). Wood fuel is pyrolyzed faster in a fluidized bed than on a grate due to its immediate contact with hot bed material. As a result, combustion is rapid and results in nearly complete combustion of the organic matter, thereby minimizing the emissions of unburned organic compounds.

1.6.3 Emissions And Controls[7-12]

The major emission of concern from wood boilers is particulate matter (PM). These emissions depend primarily on the composition of the residue fuel burned, and the particle control device. Oxides of nitrogen (NO_x) may also be emitted in significant quantities when certain types of wood residue are combusted or when operating conditions are poor.

1.6.3.1 Criteria Pollutants

The composition of wood residue and the characteristics of the resulting emissions depend largely on the industry from which the wood residue originates. Pulping operations, for example, produce great quantities of bark that may contain more than 70 weight percent moisture, sand, and other non-combustibles. As a result, bark boilers in pulp mills may emit considerable amounts of particulate matter to the atmosphere unless they are controlled. On the other hand, some operations, such as furniture manufacturing, generate a clean, dry wood residue (2 to 20 weight percent moisture) which produces relatively low particulate emission levels when properly burned. Still other operations, such as sawmills, burn a varying mixture of bark and wood residue that results in PM emissions somewhere between these two extremes. Additionally, NO_x emissions from wet bark and wood boilers are typically lower (approximately one-half) in comparison to NO_x emissions from dry wood-fired boilers.

Furnace operating conditions are particularly important when firing wood residue. For example, because of the high moisture content that may be present in wood residue, a larger than usual area of refractory surface is often necessary to dry the fuel before combustion. In addition, sufficient secondary air must be supplied over the fuel bed to burn the volatiles that account for most of the combustible material in the residue. When proper drying conditions do not exist, or when secondary combustion is incomplete, the combustion temperature is lowered, and increased PM, CO, and organic compound emissions may result from any boiler type. Significant variations in fuel moisture content can cause short-term emissions to fluctuate.

1.6.3.2 Greenhouse Gases[13-18]

Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) emissions are all produced during wood residue combustion. Nearly all of the fuel carbon (99 percent) in wood residue is converted to CO_2 during the combustion process. This conversion is relatively independent of firing configuration. Although the formation of CO acts to reduce CO_2 emissions, the amount of CO produced is insignificant compared to the amount of CO_2 produced. The majority of the fuel carbon not converted to CO_2, due to incomplete combustion, is entrained in the bottom ash. CO_2 emitted from this source is generally not counted as greenhouse gas emissions because it is considered part of the short-term CO_2 cycle of the biosphere.

Formation of N_2O during the combustion process is governed by a complex series of reactions and its formation is dependent upon many factors. Formation of N_2O is minimized when combustion temperatures are kept high (above 1475°F) and excess air is kept to a minimum (less than 1 percent).

Methane emissions are highest during periods of low-temperature combustion or incomplete combustion, such as the start-up or shut-down cycle for boilers. Typically, conditions that favor formation of N_2O also favor emissions of CH_4.

1.6.4 Controls

Currently, the four most common control devices used to reduce PM emissions from wood-fired boilers are mechanical collectors, wet scrubbers, electrostatic precipitators (ESPs), and fabric filters. The use of multitube cyclone (or multiclone) mechanical collectors provides particulate control for many wood-fired boilers. Often, two multiclones are used in series, allowing the first collector to remove the bulk of the dust and the second to remove smaller particles. The efficiency of this arrangement varies from 25 to 65 percent. The most widely used wet scrubbers for wood-fired boilers are venturi scrubbers. With gas-side pressure drops exceeding 15 inches of water, particulate collection efficiencies of 85 percent or greater have been reported for venturi scrubbers operating on wood-fired boilers.

ESPs are employed when collection efficiencies above 90 percent are required. When applied to wood-fired boilers, ESPs are often used downstream of mechanical collector precleaners which remove larger-sized particles. Collection efficiencies of 90 to 99 percent for PM have been observed for ESPs operating on wood-fired boilers.

A variation of the ESP is the electrostatic gravel bed filter. In this device, PM in flue gases is removed by impaction with gravel media inside a packed bed; collection is augmented by an electrically charged grid within the bed. Particulate collection efficiencies are typically over 80 percent.

Fabric filters (i. e., baghouses) have had limited applications to wood-fired boilers. The principal drawback to fabric filtration, as perceived by potential users, is a fire danger arising from the collection of combustible carbonaceous fly ash. Steps can be taken to reduce this hazard, including the installation of a mechanical collector upstream of the fabric filter to remove large burning particles of fly ash (i. e., "sparklers"). Despite complications, fabric filters are generally preferred for boilers firing salt-laden wood. This fuel produces fine particulates with a high salt content having a quenching effect, thereby reducing fire hazards. Particle collection efficiencies are typically 80% or higher.

For stoker and FBC boilers, overfire air ports may be used to lower NO_x emissions by staging the combustion process. In those areas of the U. S. where NO_x emissions must be reduced to their lowest levels, the application of selective noncatalytic reduction (SNCR) to residue wood-fired boilers has been accomplished; the application of selective catalytic reduction (SCR) is being contemplated. Both systems are postcombustion NO_x reduction techniques in which ammonia (or urea) is injected into the flue gas to selectively reduce NO_x to nitrogen and water. In one application of SNCR to an industrial wood-fired boiler, NO_x reduction efficiencies varied between 35 and 75 percent as the ammonia-to-NO_x ratio increased from 0.4 to 3.2.

Emission factors and emission factor ratings for wood residue boilers are summarized in Tables 1.6-1, 1.6-2, 1.6-3, 1.6-4. The factors are presented on an energy basis (pound of pollutant per million Btu of heat input). Factors for wet wood represent facilities that burn wood residue with a moisture content of 20 percent or greater. Factors for dry wood represent wood residue with less than 20 percent moisture content. Cumulative particle size distribution data and associated emission factors are presented in Table 1.6-5. Uncontrolled and controlled size-specific emission factors are plotted in Figure 1.6-1.

1.6.5 Updates Since the Fifth Edition

The Fifth Edition was released in January 1995. Revisions to this section since that date are summarized below. For further detail, consult the background report for this section. This and other documents can be found on the CHIEF Web Site at http://www.epa.gov/ttn/chief/, or by calling the Info CHIEF Help Desk at (919)541-1000.

Supplement A, February 1996

- Significant figures were added to some PM and PM-10 emission factors.
- In the table with NO_x and CO emission factors, text was added in the footnotes to clarify meaning.

Supplement B, October 1996

- SO_x, CH_4, N_2O, CO_2, speciated organics, and trace elements emission factors were corrected.
- Several HAP emission factors were updated.

Supplement D, February 1998

- Table 1.6-1, the PM-10 and one PM emission factors were revised to present two significant figures and the PM-10 emission factor for wood-fired boilers with mechanical collectors without flyash reinjection was revised to 2.6 lb/ton to reflect that these values are based on wood with 50% moisture. A typographical error in the wet scrubber emission factor for PM-10 was corrected.
- Table 1.6-2, the SO_x emission factors for all boiler categories were revised to 0.075 lb/ton to reflect that these factors are based on wood with 50% moisture.
- Tables 1.6-4 and 1.6-5 were re-titled to reflect that the speciated organic and trace element analysis presented in these tables are compiled from wood-fired boilers equipped with a variety of PM control technologies.

Supplement D, August 1998

- Table 1.6-4, the emission factor for trichlorotrifluoroethane was removed. The phenol emission factor was corrected to 1.47E-04; the phenanthrene factor was corrected to 5.02E-05; the chrysene factor was corrected to 4.52E-07; and, the polychlorinated dibenzo-p-furans factor was corrected to 2.9E-08.

Supplement E, February 1999

- In the footnotes of tables 1.6-1, 2, 3, 4, 5, 6, 7, some text was removed that described how to adjust the factors when burning wood with moisture and thermal content significantly different from 50% or 4500 Btu/lb, respectively. The EPA is revising Section 1.6 and, in the interim, consistent with EPA's recommendations regarding proper use of AP-42, the EPA encourages users of the wood combustion emission factors to account for the specific assumptions included in the factors and to convert the factors to a thermal content basis (i.e., lb/MMBtu) to estimate emissions when burning wood that differs significantly from 4500 Btu/lb or 50% moisture.

July 2001

- All emission factors were revised and new factors were added. In some cases separate factors were developed for wet wood (greater than or equal to 20 percent moisture content) and dry wood (less than 20 percent moisture).

- Separate PM and NOx emission factors are provided for dry wood combustion.

- All emission factors have been converted to units of lb/MMBtu.

- PM emission factors are specified by fuel type and control device type but not by boiler type.

- NOx, SOx and CO emission factors are specified by fuel type and not by boiler type.

- Additional toxic emission factors have been added.

- The general quality rating for PM factors are higher than before.

- TOC and CO2 emission factors are specified by all wood types and not by boiler type.

- New Source Classification Codes (SCC) were assigned for dry wood.

March 2002

- The VOC and TOC emission factors in Table 1.6-3 were calculated incorrectly. This has been corrected. The correct factors are 0.013 and 0.039, respectively.

September 2003

- The VOC emission factor in Table 1.6-3 was calculated incorrectly. This has been corrected. The correct factor is 0.017.

Table 1.6-1. EMISSION FACTORS FOR PM FROM WOOD RESIDUE COMBUSTION[a]

Fuel	PM Control Device	Filterable PM		Filterable PM-10[b]		Filterable PM-2.5[b]	
		Emission Factor (lb/MMbtu)	EMISSION FACTOR RATING	Emission Factor (lb/MMbtu)	EMISSION FACTOR RATING	Emission Factor (lb/MMbtu)	EMISSION FACTOR RATING
Bark/Bark and Wet Wood	No Control[c]	0.56[d]	C	0.50[e]	D	0.43[e]	D
Dry Wood	No Control[c]	0.40[f]	A	0.36[e]	D	0.31[e]	D
Wet Wood	No Control[c]	0.33[g]	A	0.29[e]	D	0.25[e]	D
Bark	Mechanical Collector	0.54[h]	D	0.49[e]	D	0.29[e]	D
Bark and Wet Wood	Mechanical Collector	0.35[i]	C	0.32[e]	D	0.19[e]	D
Dry Wood	Mechanical Collector	0.30[j]	A	0.27[e]	D	0.16[e]	D
Wet Wood	Mechanical Collector	0.22[k]	A	0.20[e]	D	0.12[e]	D
All Fuels[m]	Electrolyzed Gravel Bed	0.1[m]	D	0.074[e]	D	0.065[e]	D
All Fuels[m]	Wet Scrubber	0.066[n]	A	0.065[e]	D	0.065[e]	D
All Fuels[m]	Fabric Filter	0.1[o]	C	0.074[e]	D	0.065[e]	
All Fuels[m]	Electrostatic Precipitator	0.054[p]	B	0.04[e]	D	0.035[e]	
		Condensible PM					
All Fuels[m]	All Controls/No Controls	0.017[q]	A				

Table 1.6-1. (cont.)

[a] Units of lb of pollutant/million Btu (MMBtu) of heat input. To convert from lb/MMBtu to lb/ton, multiply by (HHV * 2000), where HHV is the higher heating value of the fuel, MMBtu/lb. CPM = Condensible Particulate Matter. These factors apply to Source Classification Codes (SCC) 1-0X-009-YY, where X = 1 for utilities, 2 for industrial, and 3 for commercial/institutional, and where Y = 01 for bark-fired boiler, 02 for bark and wet wood-fired boiler, 03 for wet wood-fired boiler, and 08 for dry wood-fired boiler.

[b] PM-10 = particulate matter less than or equal to 10 microns in aerodynamic diameter. PM-2.5 = particulate matter less than or equal to 2.5 microns in aerodynamic diameter. Filterable PM = PM captured and measured on the filter in an EPA Method 5 (or equivalent) sampling train. Condensible PM = PM captured and measured in an EPA Method 202 (or equivalent) sampling train.

[c] Factor represents boilers with no controls, Breslove separators, Breslove separators with reinjection, and mechanical collectors with reinjection. Mechanical collectors include cyclones and multiclones.

[d] References 19-21, 88.

[e] Cumulative mass % provided in Table 1.6-6 for Bark and Wet Wood-fired boilers multiplied by the Filterable PM factor.

[f] References 22-32, 88.

[g] References 26, 33-36, 88.

[h] References 37, 38, 88.

[i] References 26, 39-41, 88.

[j] References 26, 27, 34, 42-54, 88.

[k] Reference 55-57, 88.

[l] All fuels = Bark, Bark and Wet Wood, Dry Wood, and Wet Wood.

[m] References 27, 58, 88.

[n] References 26, 59-66, 88.

[o] References 26, 67-70, 88.

[p] References 26, 71-74, 88.

[q] References 19-21, 25, 28, 29, 31, 32, 36-41, 46, 51, 53-60, 62 - 65, 67-69, 72-75, 88.

Table 1.6-2. EMISSION FACTORS FOR NO_x, SO_2, AND CO FROM WOOD RESIDUE COMBUSTION[a]

Source Category[c]	NO_x[b]		SO_2[b]		CO[b]	
	Emission Factor (lb/MMBtu)	EMISSION FACTOR RATING	Emission Factor (lb/MMBtu)	EMISSION FACTOR RATING	Emission Factor (lb/MMbtu)	EMISSION FACTOR RATING
Bark/bark and wet wood/wet wood-fired boiler	0.22[d]	A	0.025[e]	A	0.60[f,g,i,j]	A
Dry wood-fired boilers	0.49[h]	C	0.025[e]	A	0.60[f,g,i,j]	A

[a] Units of lb of pollutant/million Btu (MMBtu) of heat input. To convert from lb/MMBtu to lb/ton, multiply by (HHV * 2000), where HHV is the higher heating value of the fuel, MMBtu/lb. To convert lb/MMBtu to kg/J, multiply by 4.3E-10. NO_x = Nitrogen oxides, SO_2 = Sulfur dioxide, CO = Carbon monoxide.
[b] Factors represent boilers with no controls or with particulate matter controls.
[c] These factors apply to Source Classification Codes (SCC) 1-0X-009-YY, where X = 1 for utilities, 2 for industrial, and 3 for commercial/institutional, and where Y = 01 for bark-fired boiler, 02 for bark and wet wood-fired boiler, 03 for wet wood-fired boiler, and 08 for dry wood-fired boiler.
[d] References 19, 33, 34, 39, 40, 41, 55, 62-64, 67, 70, 72, 78, 79, 88-89.
[e] References 26, 45, 50, 72, 88-89.
[f] References 26, 59, 88-89.
[g] References 19, 26, 39-41, 60-64, 67, 68, 70, 75, 79, 88-89.
[h] References 30, 34, 45, 50, 80, 81, 88-89.
[i] References 26, 30, 45-51, 80-82, 88-89.
[j] Emission factor is for stokers and dutch ovens/fuel cells. References 26, 34, 36, 55, 60, 65, 71, 72, 75. **CO Factor for fluidized bed combustors is 0.17 lb/MMbtu.** References 26, 72, 88-89.

Table 1.6-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS, TOC, VOC, NITROUS OXIDE, AND CARBON DIOXIDE FROM WOOD RESIDUE COMBUSTION[a]

Organic Compound	Average Emission Factor[b] (lb/MMBtu)	EMISSION FACTOR RATING
Acenaphthene	**9.1 E-07[c]**	B
Acenaphthylene	**5.0 E-06[d]**	A
Acetaldehyde	**8.3 E-04[e]**	A
Acetone	**1.9 E-04[f]**	D
Acetophenone	**3.2 E-09[g]**	D
Acrolein	**4.0 E-03[h]**	C
Anthracene	**3.0 E-06[i]**	A
Benzaldehyde	**<8.5 E-07[j]**	D
Benzene	**4.2 E-03[k]**	A
Benzo(a)anthracene	**6.5 E-08[l]**	B
Benzo(a)pyrene	**2.6 E-06[m]**	A
Benzo(b)fluoranthene	**1.0 E-07[l]**	B
Benzo(e)pyrene	**2.6 E-09[f]**	D
Benzo(g,h,i)perylene	**9.3 E-08[n]**	B
Benzo(j,k)fluoranthene	**1.6 E-07[o]**	D
Benzo(k)fluoranthene	**3.6 E-08[p]**	B
Benzoic acid	**4.7 E-08[q]**	D
bis(2-Ethylhexyl)phthalate	**4.7 E-08[g]**	D
Bromomethane	**1.5 E-05[f]**	D
2-Butanone (MEK)	**5.4 E-06[f]**	D
Carbazole	**1.8 E-06[f]**	D
Carbon tetrachloride	**4.5 E-05[r]**	D
Chlorine	**7.9 E-04[s]**	D
Chlorobenzene	**3.3 E-05[f]**	D
Chloroform	**2.8 E-05[f]**	D
Chloromethane	**2.3 E-05[f]**	D
2-Chloronaphthalene	**2.4 E-09[f]**	D
2-Chlorophenol	**2.4 E-08[u]**	C
Chrysene	**3.8 E-08[c]**	B
Crotonaldehyde	**9.9 E-06[j]**	D
Decachlorobiphenyl	**2.7 E-10[r]**	D
Dibenzo(a,h)anthracene	**9.1 E-09[l]**	B
1,2-Dibromoethene	**5.5 E-05[f]**	D
Dichlorobiphenyl	**7.4 E-10[r]**	C
1,2-Dichloroethane	**2.9 E-05[r]**	D
Dichloromethane	**2.9 E-04[v]**	D
1,2-Dichloropropane	**3.3 E-05[f]**	D
2,4-Dinitrophenol	**1.8 E-07[w]**	C
Ethylbenzene	**3.1 E-05[f]**	D
Fluoranthene	**1.6 E-06[x]**	B
Fluorene	**3.4 E-06[i]**	A
Formaldehyde	**4.4 E-03[y]**	A
Heptachlorobiphenyl	**6.6E-11[r]**	D

Table 1.6-3. (cont.)

Organic Compound	Average Emission Factor[b] (lb/MMBtu)	EMISSION FACTOR RATING
Hexachlorobiphenyl	**5.5 E-10[r]**	D
Hexanal	**7.0 E-06[z]**	D
Heptachlorodibenzo-p-dioxins	**2.0 E-09[aa]**	C
Heptachlorodibenzo-p-furans	**2.4 E-10[aa]**	C
Hexachlorodibenzo-p-dioxins	**1.6 E-06[aa]**	C
Hexachlorodibenzo-p-furans	**2.8 E-10[aa]**	C
Hydrogen chloride	**1.9 E-02[j]**	C
Indeno(1,2,3,c,d)pyrene	**8.7 E-08[l]**	B
Isobutyraldehyde	**1.2 E-05[z]**	D
Methane	**2.1 E-02[f]**	C
2-Methylnaphthalene	**1.6 E-07[z]**	D
Monochlorobiphenyl	**2.2 E-10[r]**	D
Naphthalene	**9.7 E-05[ab]**	A
2-Nitrophenol	**2.4 E-07[w]**	C
4-Nitrophenol	**1.1 E-07[w]**	C
Octachlorodibenzo-p-dioxins	**6.6 E-08[aa]**	B
Octachlorodibenzo-p-furans	**8.8 E-11[aa]**	C
Pentachlorodibenzo-p-dioxins	**1.5 E-09[aa]**	B
Pentachlorodibenzo-p-furans	**4.2 E-10[aa]**	C
Pentachlorobiphenyl	**1.2 E-09[r]**	D
Pentachlorophenol	**5.1 E-08[ac]**	C
Perylene	**5.2 E-10[f]**	D
Phenanthrene	**7.0 E-06[ad]**	B
Phenol	**5.1 E-05[ae]**	C
Propanal	**3.2 E-06[z]**	D
Propionaldehyde	**6.1 E-05[f]**	D
Pyrene	**3.7 E-06[af]**	A
Styrene	**1.9 E-03[f]**	D
2,3,7,8-Tetrachlorodibenzo-p-dioxins	**8.6 E-12[aa]**	C
Tetrachlorodibenzo-p-dioxins	**4.7 E-10[ag]**	C
2,3,7,8-Tetrachlorodibenzo-p-furans	**9.0 E-11[aa]**	C
Tetrachlorodibenzo-p-furans	**7.5 E-10[aa]**	C
Tetrachlorobiphenyl	**2.5 E-09[r]**	D
Tetrachloroethene	**3.8 E-05[t]**	D
o-Tolualdehyde	**7.2 E-06[j]**	D
p-Tolualdehyde	**1.1 E-05[z]**	D
Toluene	**9.2 E-04[v]**	C
Trichlorobiphenyl	**2.6 E-09[r]**	C
1,1,1-Trichloroethane	**3.1 E-05[t]**	D
Trichloroethene	**3.0 E-05[t]**	D
Trichlorofluoromethane	**4.1 E-05**	D
2,4,6-Trichlorophenol	**<2.2 E-08[ak]**	C

Table 1.6-3. (cont.)

Organic Compound	Average Emission Factor[b] (lb/MMBtu)	EMISSION FACTOR RATING
Vinyl Chloride	**1.8 E-05**[r]	D
o-Xylene	**2.5 E-05**[v]	D
Total organic compounds (TOC)	**0.039**[ai]	D
Volatile organic compounds (VOC)	**0.017**[aj]	D
Nitrous Oxide (N_2O)	**0.013**[ak]	D
Carbon Dioxide (CO_2)	**195**[al]	A

[a] Units of lb of pollutant/million Btu (MMBtu) of heat input. To convert from lb/MMBtu to lb/ton, multiply by (HHV * 2000), where HHV is the higher heating value of the fuel, MMBtu/lb. To convert lb/MMBtu to kg/J, multiply by 4.3E-10. These factors apply to Source Classification Codes (SCC) 1-0X-009-YY, where X = 1 for utilities, 2 for industrial, and 3 for commercial/institutional, and where Y = 01 for bark-fired boiler, 02 for bark and wet wood-fired boiler, 03 for wet wood-fired boiler, and 08 for dry wood-fired boiler.

[b] Factors are for boilers with no controls or with particulate matter controls.

[c] References 26, 34, 36, 59, 60, 65, 71-73, 75.

[d] References 26, 33, 34, 36, 59, 60, 65, 71-73, 75.

[e] References, 26, 35, 36, 46, 50, 59, 60, 65, 71-75.

[f] Reference 26.

[g] Reference 33.

[h] Reference 26, 50, 83.

[i] References 26, 34, 36, 59, 60, 65, 71-73, 75.

[j] References 26, 50.

[k] References 26, 35, 36, 46, 59, 60, 65, 70, 71-75.

[l] References 26, 36, 59, 60, 65, 70-75.

[m] References 26, 33, 36, 59, 60, 65, 70-73, 75.

[n] References 26, 33, 36, 59, 60, 65, 71-73, 75.

[o] Reference 34.

[p] References 26, 36, 60, 65, 71-75.

[q] References 26, 33.

[r] References 26.

[s] Reference 83.

[t] References 26, 72.

[u] References 35, 60, 65, 71, 72.

[v] References 26, 72.

[w] References 35, 60, 65, 71, 72.

[x] References 26, 33, 34, 59, 60, 65, 71-75.

[y] References 26, 28, 35, 36, 46 - 51, 59, 60, 65, 70, 71-75, 79, 81, 82.

[z] Reference 50.

[aa] Reference 26, 45.

[ab] References 26, 33, 34, 36, 59, 60, 65, 71-75, 83.

[ac] References 26, 35, 60, 65, 71, 72.

[ad] References 26, 33, 34, 36, 59, 60, 65, 71 - 73.

[ae] References 26, 33, 34, 35, 60, 65, 70, 71, 72.

[af] References 26, 33, 34, 36, 59, 60, 65, 71 - 73, 83.

[ag] References 26, 45.

[ah] References 26, 35, 60, 65, 71.

[ai] TOC = total organic compounds. Factor is the sum of all factors in table except nitrous oxide and carbon dioxide.

[aj] VOC volatile organic compounds. Factor is the sum of all factors in table except hydrogen chloride, chlorine, formaldehyde, tetrachloroethene, 1,1,1,-trichloroethane, dichloromethane, acetone, nitrous oxide, methane, and carbon dioxide.

[ak] Reference 83.

[al] References 19 - 26, 33 - 49, 51- 57, 77, 79 - 82, 84 - 86.

Table 1.6-4. EMISSION FACTORS FOR TRACE ELEMENTS FROM WOOD RESIDUE COMBUSTION[a]

Trace Element	Average Emission Factor (lb/MMBtu)[b]	EMISSION FACTOR RATING
Antimony	**7.9 E-06**[c]	C
Arsenic	**2.2 E-05**[d]	A
Barium	**1.7 E-04**[c]	C
Beryllium	**1.1 E-06**[e]	B
Cadmium	**4.1 E-06**[f]	A
Chromium, total	**2.1 E-05**[g]	A
Chromium, hexavalent	**3.5 E-06**[h]	C
Cobalt	**6.5 E-06**[i]	C
Copper	**4.9 E-05**[g]	A
Iron	**9.9 E-04**[k]	C
Lead	**4.8 E-05**[l]	A
Manganese	**1.6 E-03**[d]	A
Mercury	**3.5 E-06**[m]	A
Molybdenum	**2.1 E-06**[c]	D
Nickel	**3.3 E-05**[n]	A
Phosphorus	**2.7 E-05**[c]	D
Potassium	**3.9 E-02**[c]	D
Selenium	**2.8 E-06**[o]	A
Silver	**1.7 E-03**[p]	D
Sodium	**3.6 E-04**[c]	D
Strontium	**1.0 E-05**[c]	D
Tin	**2.3 E-05**[c]	D
Titanium	**2.0 E-05**[c]	D
Vanadium	**9.8 E-07**[c]	D
Yttrium	**3.0 E-07**[c]	D
Zinc	**4.2 E-04**[o]	A

[a] Units of lb of pollutant/million Btu (MMBtu) of heat input. To convert from lb/MMBtu to lb/ton, multiply by (HHV * 2000), where HHV is the higher heating value of the fuel, MMBtu/lb. To convert lb/MMBtu to kg/J, multiply by 4.3E-10. These factors apply to Source Classification Codes (SCC) 1-0X-009-YY, where X = 1 for utilities, 2 for industrial, and 3 for commercial/institutional, and where Y = 01 for bark-fired boiler, 02 for bark and wet wood-fired boiler, 03 for wet wood-fired boiler, and 08 for dry wood-fired boiler.

[b] Factors are for boilers with no controls or with particulate matter controls.

[c] Reference 26.

[d] References 26, 33, 36, 46, 59, 60, 65, 71-73, 75, 81.

[e] References 26, 35, 36, 46, 59, 60, 65, 71-73, 75.

[f] References 26, 35, 36, 42, 46, 59, 60, 65, 71-73, 75, 81.

[g] References 26, 34, 35, 36, 42, 59, 60, 65, 71-73, 75, 81.

[h] References 26, 36, 46, 59, 60, 71, 72, 73, 75.

[i] References 26, 34, 83.

[j] References 26, 33-36, 46, 59, 60, 65, 71-73, 75, 81.

[k] References 26, 71, 72, 81.

[l] References 26, 33-36, 46, 59, 60, 65, 71-73, 75.

[m] References 26, 35, 36, 46, 59, 60, 65, 71-73, 75, 81.

[n] References 26, 33 - 36, 46, 59, 60, 65, 71-73, 75, 81.

[o] References 26, 33, 35, 46, 59, 60, 65, 71-73, 75, 81.

[p] Reference 34.

SECTION 9

AIR QUALITY MODELING REPORT

PURPOSE

This air quality modeling report documents the air quality dispersion modeling analysis prepared for to support the June 2006 permit application to Idaho DEQ to operate a wood processing and energy facility in Tamarack, Idaho.

FACILITY DESCRIPTION/LOCATION

The facility is a wood products industry dimensional lumber mill that chose to remove its planer and dry kilns, ship its raw milled lumber elsewhere to be prepared for market, and use its boiler to produce energy needed locally. More detailed descriptions of the processes employed at the facility are included in the Emissions section of this Modeling Report and in the permit applications.

The facility is located in Tamarack, Adams County, Idaho, in a rural area south of New Meadows on Highway 95. There is no development bordering the facility, the land for at least a half-mile in any direction is undeveloped forest. This airshed is considered to be in attainment/unclassified for all criteria pollutants. The UTM coordinates of the center of this facility are approximately UTMN: 4977^{950}, UTME 548^{400}, located in UTM Zone 11. The facility is located on the Tamarack USGS quad. Map, as shown in Figure 3. Figures 1 and 2 show the facility location overlaid over a UTM coordinate grid.

MODEL DESCRIPTION / JUSTIFICATION

The model chosen is ISCST3, the most commonly used of the models approved by the US EPA for regulatory air quality modeling analyses. Building downwash is included in the analysis, utilizing the default Schulman-Scire downwash algorithm. Prime downwash was not employed because there was only one point source included in the modeling, and with the exception of the highway, which had only intermittent exposure; the building cavity does not extend nearly to the ambient air boundary. The ISCST3 model is applied (using Bee-Line software BEEST version 9.50 software) as recommended in EPA's *Guideline on Air Quality Models*. This analysis was accomplished consistent with the IDEQ's State of Idaho Air Quality Modeling Guideline. No formal modeling protocol was submitted but written and verbal consultations with IDEQ Lead Modeler Kevin Schilling occurred throughout the modeling process, and draft Bee-Line BEEST files documenting in detail the draft modeling methodology and data were provided to Mr. Schilling before the final modeling was prepared. Mr. Shilling's concurrence with all major details in the modeling protocol was verified on or before June 1, 2006.

Regulatory default options were employed, along with the Prime downwash algorithm. Plume depletion through deposition was not employed. As recommended by Mr. Schilling, meteorological data form the Boise airport was used after adjusting it to be meteorologically representative of the facility location. As agreed with IDEQ, modeling analyses were performed for PM-10, CO, and NO_2, and SO_2. These are the criteria pollutants identified as of interest and emitted above modeling thresholds in the Idaho Modeling Guideline. Chemical transformation of emissions was not considered.

EMISSION AND SOURCE DATA

The facility includes a log storage yard east of Highway 95. The main wood processing facilities are to the west of the highway. The facility has two debarkers to prepare logs, a lumber mill that produces dimensional lumber, and a hog and a chipper to process wood waste. The facility also includes a wood-fired boiler, which produces energy, with a wet scrubber to control emissions. Wood waste generated onsite is processed into fuel for the boiler. Pneumatic conveyors move the wood waste, saleable products, and boiler fuel from the generation sites to or from loading bins, fuel storage areas, or a large stockpile in the center of the facility. Sawn lumber prepared onsite is shipped to another mill to be finished. This facility has removed its planer and drying kilns. A process flow diagram is included for information.

The facility sources in the model will primarily be fugitive emissions. The only model point sources will be the boiler and the cooling tower. Eight model area sources represent five transfers of wood byproducts, a log and a boiler fuel stockpile, and a proposed new target box to minimize fugitive emissions when transferring potential boiler fuel. Four model volume sources include elevated bins from which chips can be transferred to trucks, a conveyor, two debarkers, and a hog to prepare wood waste as boiler fuel. Source Descriptions in Table 1 below further define the process or activity that each model fugitive source represents. Emissions from onsite vehicular traffic were not modeled, consistent with the IDEQ Modeling Guideline.

Stack and area and volume source parameters were gathered from engineering/design drawings and verified by onsite inspection.

Table 1 summarizes the model pollutant emission data.

Table 1 Tamarack Energy Model Source Data Summary

Model Point Sources		Easting (X)	Northing (Y)	Base Elev	Stk Ht	Temp	Exit Vel	Stk Diam	PMTEN	NO2	SO2	CO
Source ID	*Source Descr*	*(m)*	*(m)*	*(m)*	*(ft)*	*(°F)*	*(fps)*	*(ft)*	*(lb/hr)*	*(lb/hr)*	*(lb/hr)*	*(lb/hr)*
BOILER	Boiler	548411.6	4977936	1265.9	75	156.0	18.7	7.25	7.900	20.939	2.379	57.6
CLTWR	Cooling Tower	548434.8	4977874	1265.7	30	85.0	14.9	16	0.068			

Model Area Sources		Easting (X)	Northing (Y)	Base Elevation	Rel Ht	East Length	North Length	Angle from North	Vert Dim	PMTEN
Source ID	*Source Description*	*(m)*	*(m)*	*(m)*	*(ft)*	*(ft)*	*(ft)*		*(ft)*	*(lb/hr)*
BLOWPPIL	Blowpipe to stockpile	548290.0	4977920.0	1270.4	23.0	3.0	15.0		5.0	0.74
TR3	Transfer of mill cleanup	548331.0	4977913.0	1270.4	9.0	9.0	20.0		11.0	4.68E-06
TR4	Fuel trucked in	548331.0	4977926.0	1267.8	9.0	9.0	25.0		11.0	5.58E-05
TR5	Ash Pile transfer	548375.0	4977988.0	1265.8	5.0	8.0	6.0		8.0	0.03
TR6	Truck transfer to Potlatch	548430.0	4978082.0	1271.7	14.0	10.0	40.0	-20	3.0	0.88
ST1	Lumber storage	548750.0	4977675.0	1251.1	10.0	200.0	1900.0	-16	20.0	0.00
ST2	Outdoor storage pile	548190.0	4977839.0	1271.9	15.0	450.0	450.0		24.0	2.04
P4	Proposed Target Box	548335.0	4977974.0	1268.4	6.0	5.0	5.0		5.0	0.32

Model Volume Sources		Easting (X)	Northing (Y)	Base Elevation	Release Height	Horiz Dim	Vert Dim	PMTEN
Source ID	*Source Description*	*(m)*	*(m)*	*(m)*	*(ft)*	*(ft)*	*(ft)*	*(lb/hr)*
TKBINS	chip and sawdust bins	548429.6	4978088.0	1259.8	35.0	11.6	16.7	1.145
TR1	Conveyor to stockpile	548385.0	4977988.0	1265.1	10.0	4.7	2.3	4.57E-05
DEBARK	Debarkers	548383.0	4977999.0	1265.2	6.0	4.7	2.3	0.289
HOG	Hog	548383.0	4977995.0	1265.2	5.0	4.7	2.3	0.051

As mentioned above, modeling analyses were performed for PM-10, CO, NO_2, and SO_2. For the purposes of this analysis, all NOx emitted was assumed to be NO_2. Modeled emission rates are the maximum hourly rates estimated in the permit application. All modeled sources were assumed to emit at the hourly rates in Table 1 for 8,760 hours per year, to estimate the worst-case impacts under allowable emissions from the facility. That assumption is very conservative, representing 20% more emissions than the permit will allow for the annual averaging period. The stack parameters were verified to represent actual operational emissions scenarios consistent with construction plans.

Building downwash was accounted for by using the Schulman-Scire downwash algorithm in the ISCST3 model analysis. All significant buildings within the facility were entered into the model to estimate potential downwash impacts.

Figure 1 shows the model layout, with facility buildings and emission points. The solid line and the dashed line surrounding the sources is the facility property boundary on each side of the highway. The dots from south to north across the figure through the facility represent ambient air receptors placed along Highway 95, which crosses the facility. The property boundary serves as the ambient air boundary for this analysis. Facility personnel are trained to aggressively discourage unauthorized access. All model sources are shown in red. The only emission area shown east of the highway is the log storage yard, which has very little to no regulated emissions. Onsite buildings are shown in black. The coordinates are the zone 11 UTMs, in meters.

Figure 1 Model Source and Facility Layout

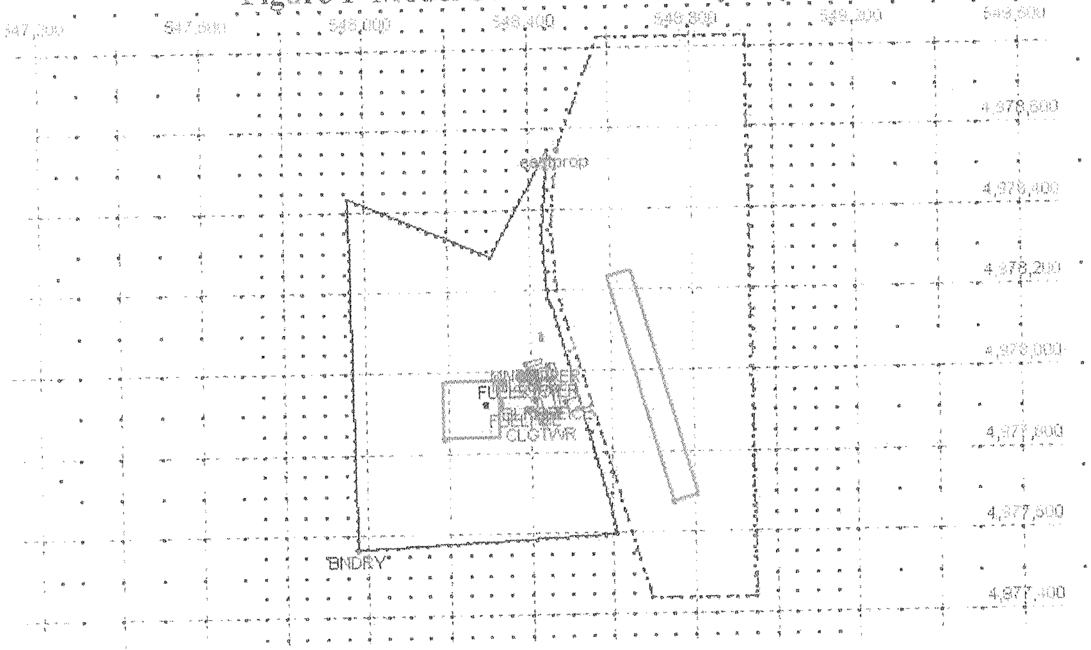
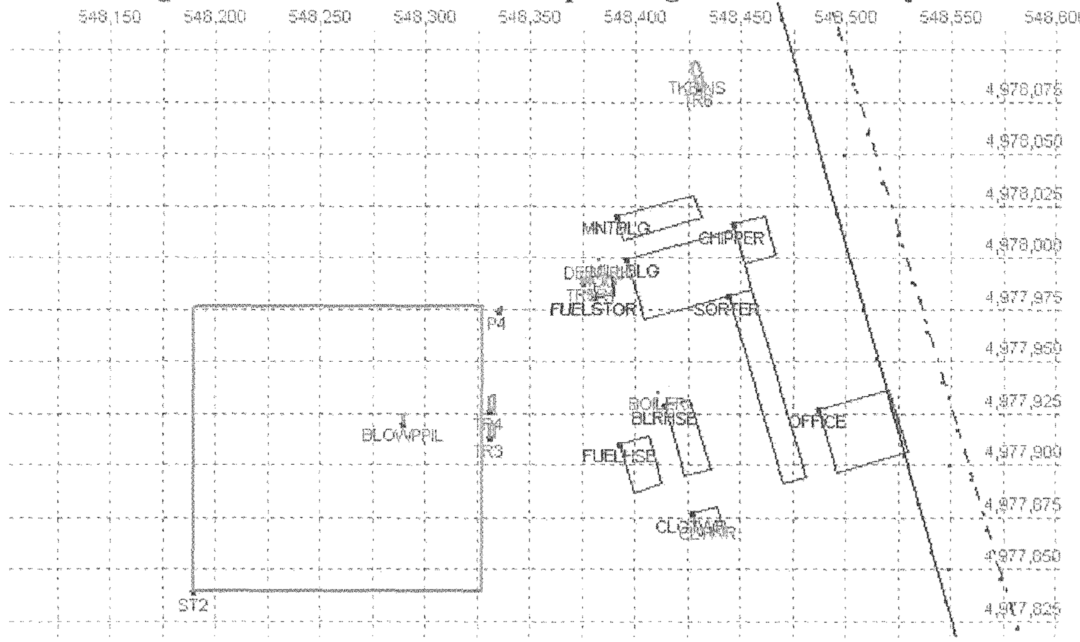


Figure 2 provides a closer view of the model layout and sources in and around the main mill and boiler activity area. All model sources are shown and labeled in red, and the coordinates are the zone 13 UTMs, in meters. Onsite buildings are shown and labeled in black on this figure. The solid line and the dotted lines on the east side of the picture represent the facility property boundary along each side of Highway 95.

Figure 2 Model Source Main Operating Area Source Layout



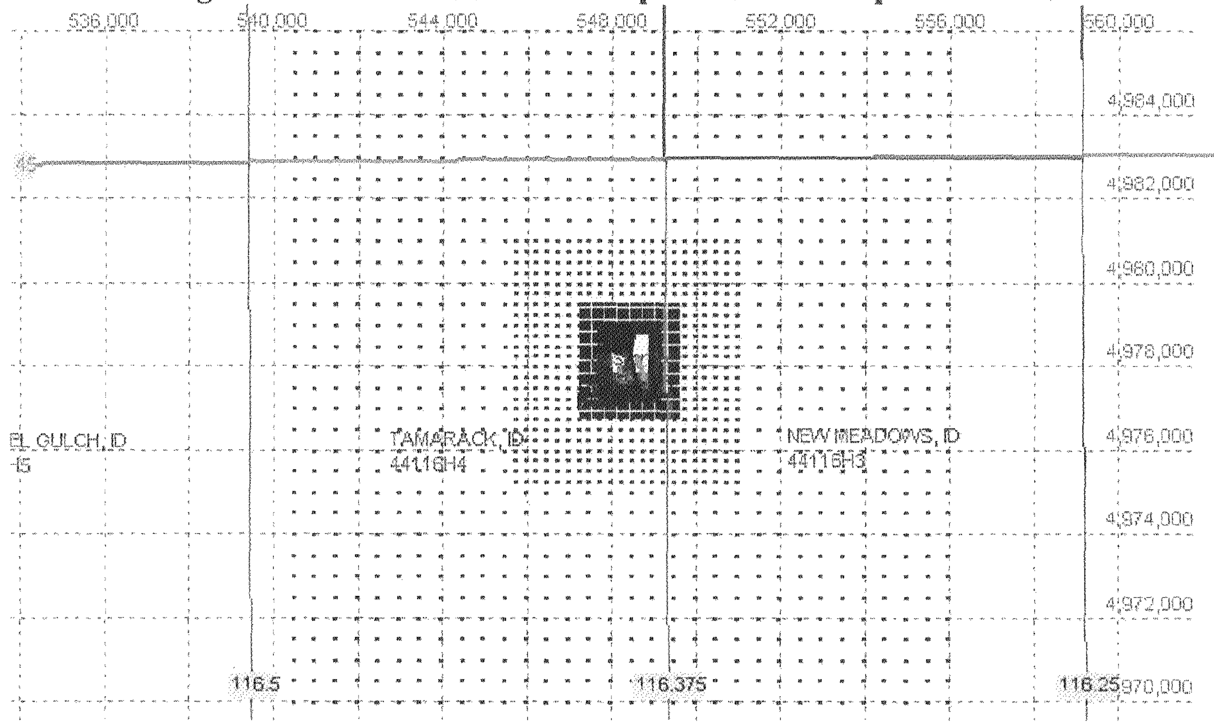
MODEL DOMAIN AND RECEPTOR NETWORK

Model receptors were placed from the public access limit out at least 10 kilometers exactly as recommended in densities exceeding requirements in the Idaho Modeling Guideline. Receptor density is 25 meters along the ambient air boundary, then 50 meters for the first 500 meters away from the property boundary, 100 meters out to 1 kilometer from the ambient air boundary, 250 meters out to 2.5 kilometers, and 500 meters out to the 8m edge of the receptor network.

Initial permit modeling and final modeling results showed that maximum predicted impacts occur on the facility's ambient air boundary, within the boundary's 25-meter grid density before or at its transition point to 50 meter grid density. The grid spacing at the point of maximum impact was less than 100 meter and exceeds IDEQ receptor density requirements. For that reason, and because predicted impacts beyond the 100 meter grid density dropped off considerably and were well below applicable impact limits, the receptor network employed for this analysis effectively captured maximum impacts.

Figure 3 below shows the facility and its ambient air boundary, the thirty external sources modeled (in red), the model domain, the latitude and longitude grids in the vicinity, and the USGS quad maps that cover the model domain. Also shown, in red, are the external sources identified by WDEQ that were modeled as potential co-contributing sources.

Figure 3 Model Domain and Complete Model Receptor Network



ELEVATION DATA

All elevations in the model (source and building base, terrain and receptors) were calculated from USGS 7.5-degree (30 m or less horizontal resolution) DEM data downloaded from Geo Community (www.geocommunity.com), the USGS freeware download system, using the Bee-Line BEEST preprocessing system. Geo Community provides NAD 83 DEM data when available, NAD 27 only if NAD 83 data is unavailable.

METEOROLOGICAL DATA AND LOCAL PARAMETERS

As recommended by WDEQ, five years of NWS surface and upper air data from the Boise airport were processed with the EAP PCRAMMET program into model ready ASCII meteorological data files. The five years of meteorological data from 1987 to 1991. Each year's meteorological data set met EPA data capture requirements. As discussed with Mr. Schilling at IDEQ, the wind directions in that modeling file were rotated 45 degrees to correspond with the terrain forcing up and down the relatively tight valley the facility is located in. This approach was consistent with Mr. Schilling's recommendations, and recent air quality modeling prepared for the facility.

LAND USE CLASSIFICATION

Land use and the level of development in the vicinity will affect the surface roughness setting discussed above. By the traditional Auer algorithm or any other reasoning, the land in the vicinity of the facility and across the model domain is generally open and features virtually no development. Therefore, rural dispersion coefficients were used in this analysis.

BACKGROUND CONCENTRATIONS

PM-10 and SO_2 background concentrations representative of rural agricultural areas in Idaho recommended for use in this analysis were provided by Mr. Schilling of IDEQ in a May 31 telephone conversation. The background values were based upon monitoring from rural agricultural or minimally developed areas in Idaho. The recommended background values for PM-10 are 43 ug/m^3 over a 24-hour period and 9.6 ug/m^3 over an annual period, for SO_2 are 34 ug/m^3 over a 3-hour period, 26 ug/m^3 over a 24-hour period, and 8 ug/m^3 over an annual period. Recommended background values for NO_2 are 4.3 ug/m^3 over an annual period. Those background values are shown in the third column in Table 4.

EVALUATION OF COMPLIANCE WITH APPLICABLE AMBIENT IMPACT STANDARDS

Table 3 shows the maximum model predicted impact each year for each pollutant for each averaging period modeled. Reported values represent model predicted maximum impacts for the annual average period, and model predicted second maximum for all shorter averaging periods.

Table 3 Maximum Ambient Pollutant Impact (μg/m^3)

Pollutant	Averaging Period	1987	1988	1989	1990	1991
PM-10	24-hour	69.1	**92.2**	83.1	82.2	73.6
	Annual	16.6	18.3	**18.4**	17.5	16.8
SO_2	3-hour	14.1	14.6	16.9	15.5	**17.2**
	24-hour	4.6	**4.97**	3.9	4.4	4.3
	Annual	0.86	**0.95**	0.86	0.90	0.91
NO_2	Annual	7.6	**8.3**	7.6	7.9	8.0
CO	1-hour	733	818	872	**932**	820
	8-hour	233	**251**	217	199	199

The maximum predicted impacts for SO_2 and CO are below significant impact levels (SILs) for those pollutants.

The impact limit standards applicable to this permit application are the National Ambient Air Quality Standards (NAAQS) for criteria pollutants, and the Idaho ambient impact limits listed in Table 4. Predicted total concentrations are model predicted maximum ambient impacts during facility operation plus background concentrations for criteria pollutants. Model predicted maximum impacts reported are the highest first maximum predicted over the one years modeled for all averaging periods.

Table 4 Background Concentrations, Ambient Impact Limits and Comparison with Ambient Air Quality Standards

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)	Modeled Impact ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	IdAAQS ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
PM_{10}	24-hour	43	92.2	135.2	150	150
	Annual	9.6	18.3	27.9	50	50
	3-hour	34	17.2	51.2	1300	1300
SO_2	24-hour	26	4.97	31.0	365	365
	Annual	8	0.95	9.0	80	80
NO_2	Annual	4.3	8.3	12.6	100	100
CO	1-hour		932		2,000 (SIL)	
	8-hour		251		500 (SIL)	

Model predicted maximum impacts for all pollutants and averaging periods to occur on or in the first receptor beyond the ambient air / property boundary. The receptors on the boundary are spaced 25 meters apart, the first receptor beyond ranges from 25 to 50 meters further from the boundary and are spaced 50 meters apart. The only pollutant for which model predicted impacts approach ambient air quality standards is PM-10. Model predicted PM-10 maximum impacts are dominated by fugitive emissions whose impacts are challenging to estimate and are believed to be conservatively overestimated here. Those maximum impacts occur on Highway 95 or its right-of-way, where public exposure is generally limited to the very brief time it takes travelers to pass through the area. The only facility source for the gaseous pollutants modeled is the facility boiler with scrubber. The maximum model predicted impact for NO_2, SO_2, and CO all occur at or just beyond the property boundary. The CO and SO2 impacts are insignificant (below SILs), and the NO_2 impact is an order of magnitude below the NAAQS.

Figure 4 below shows the maximum impacts predicted for 24-hour average PM-10. All receptors with significant impacts (maximum impacts predicted to be over the 5 $\mu g/m^3$ SIL) are shown in bold. Note that the higher predicted impacts are clustered around the property boundary, especially along Highway 95, with no impacts over 15 $\mu g/m^3$ beyond 500 meters, and that impacts drop off to insignificant levels promptly in all directions. The slightly extended area of significant impacts to the north and south demonstrates that the winds, after corrections documented above, align with the orientation of the valley the source is located in.

Figure 4 Maximum Predicted 24-hour Average PM-10 Impacts

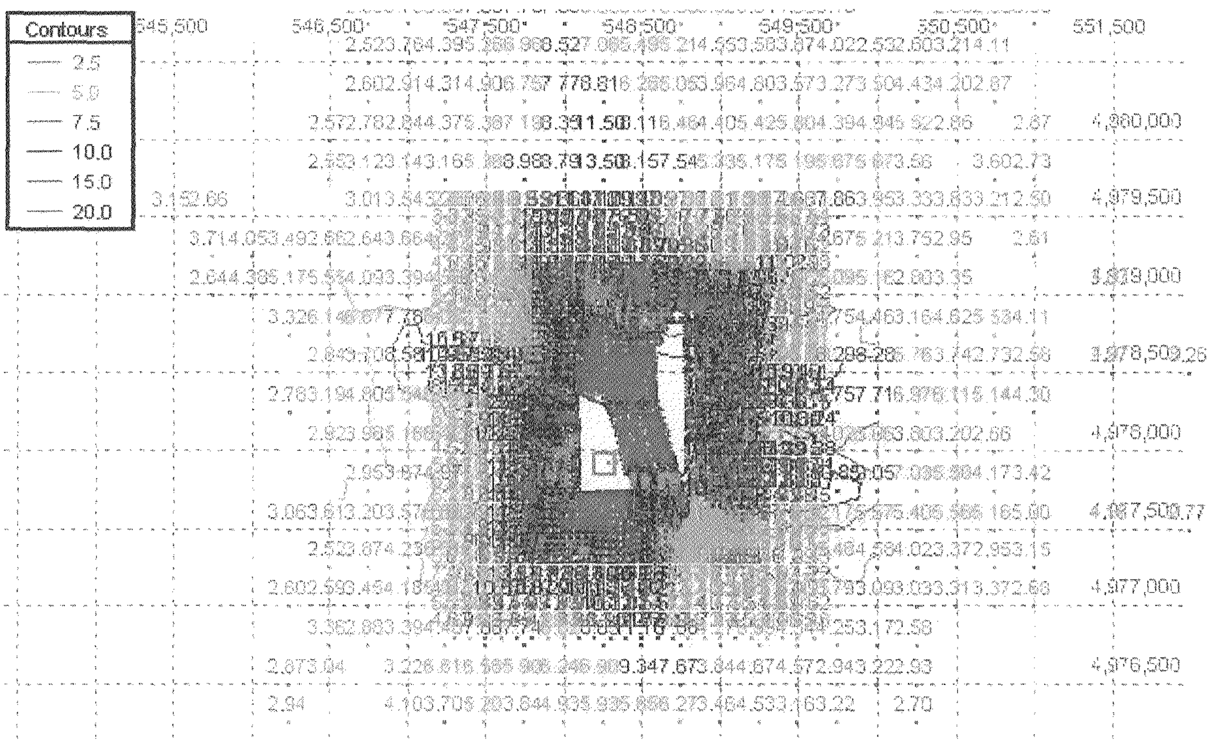


Figure 5 shows the maximum impacts predicted for annual average PM-10. All receptors with maximum impacts predicted to be over 5 $\mu g/m^3$ are shown in bold. All such impacts are along Highway 95 where it passes through the facility or within 600 meters of the north or south property / ambient air boundary.

Figure 5 Maximum Predicted Annual Average PM-10 Impacts

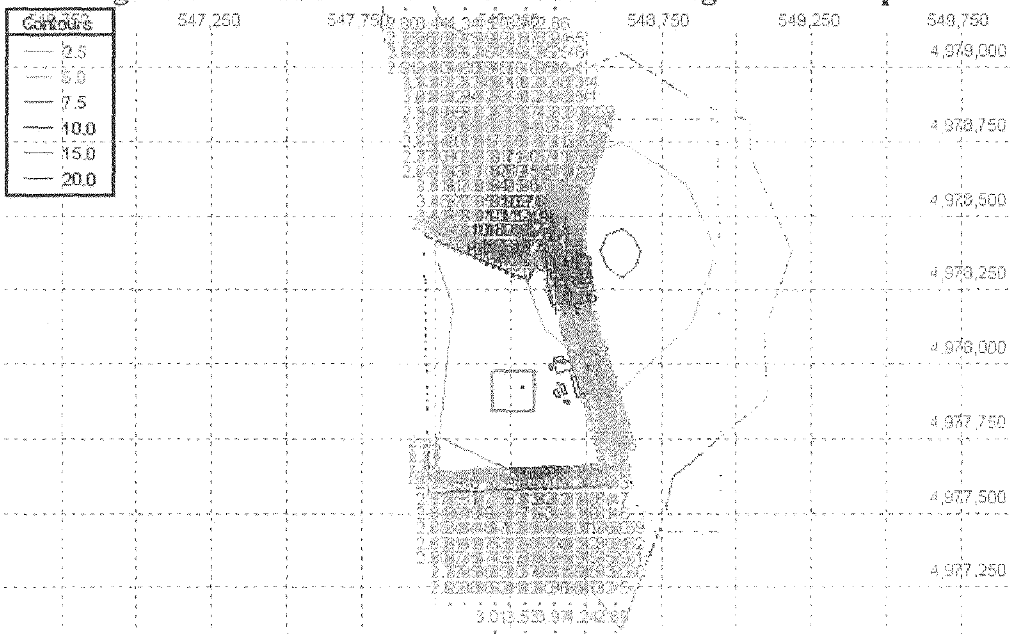
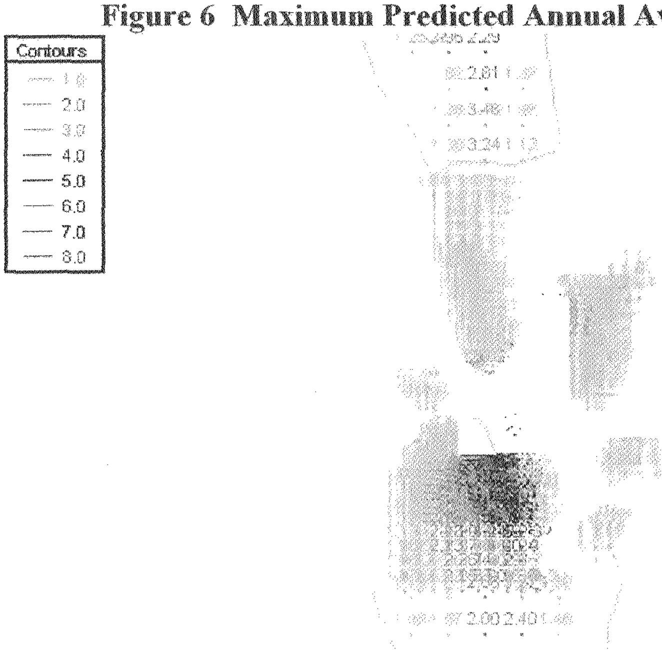


Figure 6 shows the maximum impacts predicted for annual average NO_2. All receptors with maximum impacts predicted to be over 3 $\mu g/m^3$ are shown in bold. Note that all such facility impacts are within 1.2 kilometers up or downvalley of the facility. Recall, too, that this analysis conservatively assumes all NOx emitted is NO_2, and that no depletion occurs despite the heavy forests in the area.

Figure 6 Maximum Predicted Annual Average NO_2 Impacts



ELECTRONIC COPIES OF THE MODELING FILES

Electronic copies of all input, output, and support modeling files necessary to duplicate the model results are provided to IDEQ in the enclosed file "Tamarack AQ Modeling Files 0606.ZIP."

The meteorological data files are identified as BOIyy.ASC, where yy = 87 – 91 for the years 1986 to 1990.

The ISCST3 input and output files are identified as TAM06_yy_pp.ext, where yy identified the year as in the meteorological data files, pp identifies the pollutant as SO2 for SO_2, NOx for NO_2, CO for CO, or PMTEN for PM-10, and ext is .DTA for model input files, .LST for model output files.

The .PIP and .SO files are the BPIP input and output files.